TAMPERE UNIVERSITY OF TECHNOLOGY

TUULI TYRVÄINEN

BUSINESS INTELLIGENCE TRENDS IN FINLAND IN 2013

Master of Science Thesis

Prof. Mika Hannula has been appointed as the examiner at the Council Meeting of the Faculty of Business and Technology Management on May 15th, 2013.

ABSTRACT

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Business intelligence (BI) is an important management tool for companies in order to make right decisions at the right time. BI, in its different forms, has been studied globally for several decades and in Finland a unique research series was started at Tampere University of Technology in the beginning of the 21st century. This study is already fifth realization, which continues the tradition of the studies conducted in 2002, 2005, 2007 and 2009.

The main objective of this research is to examine the current state of business intelligence in companies operating in Finland and to identify BI related trends by comparing the research results to former studies. In order to form a comprehensive picture of BI it is observed from different points of view based on literature. Also hypothetical BI trends are identified. In addition to this theoretical part an empirical part is conducted. In order to collect extensive research material, all in all 56 companies from seven different industries were surveyed primary by telephone interviews.

The results suggest that BI has established a steady position in the large companies operating in Finland. BI is not usually considered as a separate function but it is often dispersed in different functions of the company. This conclusion is supported by the fact that majority of the companies have no separate budget or strategy for BI. Over half of the respondents mentioned that they had not yet reached the aimed level in BI or that there were some improvement needs identified in BI. Also majority of the companies are going to increase substantially or moderately the companies' investments in BI within the next five years. According to the study there is variation between the different industries. For example on the field of real estate and construction none of the subject companies had a separate budget for BI where as in the manufacturing industry around half of the companies had defined a separate budget for BI. The findings of this study can be used to understand better the BI applied by Finnish companies and to identify important BI trends.

TIIVISTELMÄ

TAMPEREEN TEKNILLINEN YLIOPISTO
Tietojohtamisen koulutusohjelma

TYRVÄINEN, TUULI: Liiketoimintatiedon hallinnan trendit Suomessa vuonna 2013
Diplomityö, 80 sivua, 3 liitettä (36 sivua)
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Avainsanat: liiketoimintatiedon hallinta, trendit, suomalaiset yritykset, survey-tutkimus

Liiketoimintatiedon hallinta (eng. business intelligence) on tärkeä yrityksen päätöksentekoa tukeva työkalu. Liiketoimintatiedon hallintaa sen eri muodoissa on tutkittu ympäri maailmaa vuosikymmenten ajan ja aiheeseen liittyen aloitettiin ainutlaatuinen tutkimussarja 2000-luvun alussa Tampereen teknillisellä yliopistolla. Tämä tutkimus on viides toteutuskerta tässä tutkimussarjassa, jonka aikaisemmat toteutukset on tehty vuosina 2002, 2005, 2007 ja 2009.

Tutkimuksen päätavoite on tunnistaa liiketoimintatiedon hallinnan nykytila Suomessa toimivissa yrityksissä ja tunnistaa liiketoimintatiedon hallinnan trendejä verrattaessa tutkimustuloksia aikaisempien toteutusten tuloksiin. Jotta liiketoimintatiedon hallinnasta saadaan muodostettua kattava kuva, sitä tarkastellaan eri näkökulmista perustuen kirjallisuuteen ja samalla muodostetaan liiketoimintatiedon hallintaan vaikuttavia hypoteettisia trendejä. Teoreettisen osuuden lisäksi tutkimukseen kuuluu myös empiirinen osuus. Tutkimusmateriaali kerättiin kyselytutkimuksella. Kaikkiaan 56 yritystä seitsemältä eri toimialalta haastateltiin pääsääntöisesti puhelimitse.

Tutkimustulokset osoittavat, että liiketoimintatiedon hallinta on vakiinnuttanut asemansa Suomessa toimivissa suurissa yrityksissä. Sitä ei kuitenkaan mielletä yrityksissä erillisenä kokonaisuutena, sillä useimmilla yrityksillä ei ole erillistä budjettia tai strategiaa liiketoimintatiedon hallinnalle ja se on usein hajautunut yrityksen eri toimintoihin. Yli puolet vastaajista koki, että liiketoimintatiedon hallinta ei ole vielä halutulla tasolla tai toiminnassa oli havaittu jotain kehityskohteita. Lisäksi suurin osa yrityksistä kertoi kasvattavansa panostuksiaan liiketoimintatiedon hallintaan huomattavasti tai hieman seuraavan viiden vuoden aikana. Eri toimialaryhmien tarkastelun perusteella voidaan huomata vaihtelua eri ryhmien välillä. Esimerkiksi kiinteistöt ja rakentaminen –alalla yhdelläkään yrityksellä ei ole erillistä budjettia liiketoimintatiedon hallinnalle kun taas teollisuudessa noin puolella yrityksistä on erillinen budjetti liiketoimintatiedon hallinnalle. Tutkimuksen tuloksien avulla voidaan ymmärtää paremmin suomalaisissa yrityksissä toteutettavaa liiketoimintatiedon hallintaa ja tunnistaa tärkeitä trendejä.

PREFACE

-Pahastutko, jos annan pienen neuvon?

-Sen kun.

-Jokaiseen selitykseen tai loogiseen päättelyyn, joka selvittää kaiken noin yksinkertaisesti, kätkeytyy ansa. Puhun omasta kokemuksesta. Joku on joskus sanonut, että jos jokin asia voidaan selittää yhdessä ainoassa kirjassa, sitä ei kannata selittääkään. Älä siis tee liian äkkinäisiä johtopäätöksiä.

Haruki Murakami, Sputnik-rakastettuni

It is quite amazing what can happen in six months, one important business intelligence research project for example. Even though this thesis is only one small piece in the multidimensional global field of business intelligence, I genuinely believe that the results of this study will be valuable for the participating companies and also to others working with business intelligence in Finland. The results of the study have been reported also in Finnish and I am more than happy to share these results with those who are interested.

I would like to thank my supervisor Professor Mika Hannula who has successfully guided me through the multiphase path of thesis project and has been an inspirator already from the beginning of my university studies. I want to express my gratitude to Timo Tuomenpuro from KPMG who has been a valuable instructor and an important initiator to the whole project. The influence of Timo's enthusiasm and positive attitude is impossible to avoid. I wish to express my appreciation to the Department of Business Information Management and Logistics, Tampere University of Technology and KPMG that have provided a flexible work environment and enabled the co-operation with intelligent people. Special thanks to Jussi Myllärniemi (TUT) and Vilma Vuori (TUT), who have had the time to answer my numerous questions.

Especially I would like to thank my family and friends that have been there for me throughout my studies. This journey would not have been as much fun and as enjoyable without them.

Tampere, June 25th 2013

Tuuli Tyrväinen

TABLE OF CONTENTS

ABSTRACT i

TIIVISTELMÄ ii

PREFACE iii

TABLE OF CONTENTS iv

ABBREVIATIONS vi

1. INTRODUCTION 1

1.1. Starting point 1

1.2. Former studies 2

1.3. Purpose of the study and research questions 4

1.4. Scope and limitations 4

1.5. Research design, strategy and methods 6

1.6. Structure of the study 10

2. APPROACHES TO BUSINESS INTELLIGENCE 11

2.1. History of business intelligence 11

2.2. Business intelligence – the bigger picture 12

2.3. Dear child has many names 14

2.4. Business intelligence as a process 16

2.5. A cube of business information 19

3. BUSINESS INTELLIGENCE TRENDS IN FINLAND 22

3.1. Definition of a trend 22

3.2. Former business intelligence trends identified in Finland 23

3.3. Possible trends related to business intelligence 24

3.3.1. Data features 25

3.3.2. Technologies and supportive activities 27

3.3.3. New ways of working 29

4. SURVEY EXECUTION 30

4.1. Survey planning and practices 30

4.2. Description of the data 31

5. RESULTS OF THE EMPIRICAL RESEARCH 33

5.1. Specification of the activity 33

5.2. Organization of business intelligence 36

5.3. Business intelligence methods and tools 43

5.4. Benefits of business intelligence 49

5.5. Future 56

6. DISCUSSION OF THE RESULTS 68

6.1. Key results and conclusion 68

6.2. Evaluation of the study 72

6.3. Further research themes 75

BIBLIOGRAPHY 76

ABBREVIATIONS

BI	Business Intelligence
CI	Competitive Intelligence
ERP	Enterprise Resource Planning
ICT	Information and Communication Technology
LUT	Lappeenranta University of Technology
MI	Market Intelligence
OLAP	Online Analytical Processing
TUT	Tampere University of Technology

1. INTRODUCTION

1.1. Starting point

Companies have always collected information about their business but to be the one ahead of others means that you have to be able to use this ever crowing amount of information in your favor. Business intelligence can be seen as a tool (Goshal & Kim 1986), process (Gilad & Gilad 1986) or a system (Thierauf 2001) but the basic idea is always to manage and enrich business information and to produce up to date actionable knowledge and intelligence for decision making in different managerial levels.

Business intelligence (BI) is an important part of organization's functions if we believe the recent studies and the news from the business world. In 2009 Vuori and Hannula stated that despite the economical situation 59 percent of the examined Finnish companies are going to increase their investments in BI and only 9 percent are going to cut the investments (Vuori & Hannula 2009, p. 23). In another Finnish study, discussing future know-how needs in technology industry, companies estimated that the importance of documentation and BI is going to evolve the most in the field of knowledge management (Meristö et al. 2008, p. 19). The situation in Finland seems to reflect the worldwide state of BI. The latest Gartner study shows that CIOs rank BI and analytics as number one in technology priorities (Gartner 2012). It seems that business intelligence is valued around the world and that companies want to stay updated about the BI field. The aim of this study is to examine the business intelligence situation and the current trends of business intelligence in Finland in order to have up to date picture of the situation for the companies operating in Finland and for the academic world.

The study is a continuum for four studies that were conducted in 2002-2009. All these four studies concentrated on business intelligence in top 50 Finnish companies listed by their annual revenue in Finnish business magazine Talouselämä (see e.g. Talouselämä 2012). Now in 2013 this research is aiming to reveal the current BI situation in Finland and create comparable information considering the former studies so that it is possible to identify some developments (or a lack of development). What is more the study takes now a slightly different focus by taking the sample from the top 500 in contrast to the top 50 Finnish companies listed by Talouselämä. The subjects chosen from the top 500 companies are also divided into seven different groups:

- Energy
- Real estate and construction
- Consumer goods and commerce
- Banking, financing, insurance business and administration of property
- Information technology, media and telecommunications
- Manufacturing industry
- Other

With the previously presented changes the study will hopefully bring new viewpoints to the former studies when it is possible to see the current BI situation on a certain industry group. In the former ”Top 50” –studies these kinds of industry specific analysis have not been made in this extent. However, these changes might affect the comparability of this study in relation to the former “Top 50” studies and the circumstances have to be carefully considered when making the comparison between the studies.

This research project is conducted together with KPMG Oy Ab and the Department of Business Information Management and Logistics (Tampere University of Technology). KPMG Oy Ab is part of a global network of professional firms providing Audit, Tax and Advisory services. In Finland KPMG has together 750 employees in 17 offices. The Department of Business Information Management and Logistics conducts research for example about business information management and offers studies in various themes.

1.2. Former studies

The Department of Business Information Management, in partnership with different enterprises, has conducted already four studies related to business intelligence by interviewing the 50 biggest Finnish companies (listed in Talouselämä by their revenue). In this thesis the terms “former” studies and “Top 50” -studies are referring specifically to these studies that were conducted in 2002, 2005, 2007 and 2009.

The aim of the first research was to find out, what the meaning of BI is in Finnish companies in 2002. The study continued in 2005 when the nature and state of BI in Finnish companies was examined. The aim in the second study was also to answer the questions, how Business Intelligence had been changed between 2002 and 2005 and which were the possible trends to be identified. In 2007 the focus of the study was somewhat the same. The state of BI in Finnish companies in 2007 was compared with the former studies. The latest study about the BI in top 50 Finnish companies is from 2009. Again, one of the main goals was to maintain the comparability to the former studies. These four studies have given valuable information about the state of business intelligence in Finnish companies from the beginning of the 21st century and the results have been used both in the academic world and in the business field.

This kind of repetitive research about BI in Finnish companies has not been studied in other Finnish organizations. Business intelligence related subjects have been researched in individual publications and with slightly different focus. For example at the University of Turku one study from 2008 discusses about BI in Finnish small and medium-sized maritime companies (Makkonen et al. 2008) and a MBA-development work in University of Tampere aims to improve the hospital district of Pirkanmaa from the BI point of view (Herrala 2009). There can be found also numerous master's thesis related to BI –area from different universities especially from Tampere University of Technology (TUT) and Lappeenranta University of Technology (LUT) because these universities have master level studies about BI. These master's thesis publications were searched from LUTPub database (Doria 2012) and from the webpage of Department of Information Management and Logistics (Department of Information Management and Logistics 2012).

VTT Technical Research Center of Finland has released research notes about Data Mining Tools for Technology and Competitive Intelligence (Ruotsalainen 2008) and an article titled "Methods and tools contributing to FTA: A knowledge-based perspective" (Eerola & Miles 2011). One research project called ComBI that was conducted in 2006-2008 with the Department of Business Information Management and Logistics, gave some guidelines to BI functions and processes at the construction field. VTT is not the only player in the business field who is interested about BI research. In 2010 Solita, a Finnish IT-service company together with Market-Visio did a research about BI from a technology point of view. This study revealed that BI –solutions are used mainly to support operative management and to report financial numbers. The potential of BI is not significantly recognized as a tool of management and strategy planning. (My news desk 2010.) This study has had continuum in 2012 (Solita 2012). Unfortunately the background information of these Solita's studies was not available and thus the validity of the conclusions has to be considered carefully. Anyhow the existence of these studies indicates the interest of BI on the Finnish business field.

Several studies have been made about the state of business intelligence around the world (see e.g. Gartner 2012, Herschel 2011, Wright & Calof 2006) indicating that companies are familiar with business intelligence and are interested to develop it further. For example Wright & Calof (2006) states that the majority of respondents (80 per cent) indicated that senior management felt that competitive intelligence (CI) was an essential input to strategic decision making. It was also noted that 78 per cent considered CI as an essential component of marketing strategy formulation. Competitive intelligence can be sometimes referred to business intelligence. (Wright & Calof 2006.) Discussion about Gartner's 2012 BI predictions and company driven research about BI confirms the growing need to understand business intelligence. (see e.g. Bates & Wall 2012; Herschel 2011)

As we have seen, BI is discussed and seen important all over the world, also in Finland. With over 10-year-old history this research series that discusses BI can be seen unique in Finland. With this study this research tradition can be continued and new comparable information can be produced. What is more, it is possible to identify new trends and insights about the state of business intelligence in companies operating in Finland.

1.3. Purpose of the study and research questions

The primary aim of the study is to examine the current state of business intelligence in companies operating in Finland. And further, this information is compared with former studies so that business intelligence related trends can be identified. This research problem can be expressed in a form of the following research questions:

- What is the state of business intelligence in companies operating in Finland in 2013?
- What are the main trends affecting on business intelligence field in Finland?

To be able to answer these main research questions some sub questions can be formed:

- What are the current ways of conducting business intelligence in the target companies operating in different industries?
- How has the situation in 2013 changed compared to the former studies?
- How is business intelligence going to develop in the target companies in the future?

As we can see, the answers will describe the current situation, compare it with history information and possibly predict the future. In this study the primary stress will be on the current situation and identifying ongoing trends. However, to be able to perceive trends the history information is needed to form a picture about the development.

The research questions will be studied using literature and empirical research. First the definition of business intelligence is created based on the literature. Also the current and possible forthcoming business intelligence trends are examined using literature. This theory base is used to support the empirical part where the subject companies are involved. To understand how BI has developed, the results will be compared to former studies of the same research series. Together the theory part and the empirical part will be used to answer the two main research questions.

1.4. Scope and limitations

There is creditable amount of literature, reports and studies about business intelligence and the topics related to that, perhaps thanks to the trend-like phenomenon that BI created in the 1990s. Thus finding source material is not a problem but the quality of the sources and their relevance to this study have to be considered, also bearing in mind that

business intelligence can be understood in different ways. Even though BI has been discussed since the 1980s (see e.g. Ghoshal & Kim 1986; Gilad & Gilad 1986; Tyson 1986) there is still not a clear consensus about the terms used. Business intelligence as a term can have many different meanings and there can be found different approaches to BI depending on who is discussing about it. In this study the term business intelligence is used because former studies have indicated that it is the most commonly used term in Finland (see e.g. Pirttimäki & Hannnula 2002; Koskinen et al. 2005; Halonen & Hannula 2007; Vuori & Hannula 2009) and because usually BI is considered as a wider "umbrella term" for related concepts (see e.g. Tyson 1986; Pirttilä 2000; Pirttimäki 2007). Different points of view about BI are discussed more in the chapter 2.

Business intelligence is a global phenomenon and thus it has been studied all around the world. The global point of view is going to be considered when defining business intelligence and when examining the studies related to the topic in order to see the overall picture. The main focus in this research however is on the business intelligence in companies operating in Finland and hereby the state of business intelligence in Finland. All the subject companies are chosen from the top 500 biggest (by revenue) Finnish companies. It can be assumed that BI is more commonly used in larger companies and in order to gain informative results the focus of this study is also on large companies[1]. Because of the resource limitations all of these 500 companies cannot be involved in the study. Thus the aim is to get a sample of 60 companies and cautiously generalize these results.

In the former "Top 50" –studies the target companies were divided into three sectors: industry, trade and services, and ICT. Now the target companies are chosen from different business sectors, presented in the Introduction -chapter, in order to make new and interesting comparisons. The business sectors were chosen based on the sectors that were well presented among the top 500 biggest companies to be able to get enough participants from each industry. The participants of the empirical part will be from the managerial level and thus examining the situation from a higher hierarchy level. Normally the business intelligence is seen more as a managerial level tool (see e.g. Pirttilä 2000, s. 186; Goshal & Kim 1986, p. 56; Gilad & Gilad 1986, p 53; Thierauf 2001, p. 66). Due to these facts the approach of this study will be taken from the BI managerial level.

Because of the limited access to the data from former related "Top 50" -studies the comparison to these studies can be done only based on the published reports, which include only certain highlights of the analyzed data. This might give some restrictions what variables can be compared and how deep the analysis can go. Also because of the length limitations of the thesis work it is not possible to examine all the former

[1] *Each of the last five companies in the top 500 had the revenue of 87 million euros (Talouselämä 2012).*

empirical findings in detail and compare them with the forthcoming empirical study. This is why the study will be compared mainly with the "Top 50" –study from the 2009 and the focus of the analysis is going to be on the current situation in 2013 that can be identified from the primary information collected with the empirical study. To keep the focus on BI approaches relevant for this study and due to the length limitations, related issues like knowledge creation and the different types and levels of information will not be discussed inclusively.

1.5. Research design, strategy and methods

The need for new information can strive from many sources. According to Hirsijärvi et al. (2007) research is often conducted because there is a problem to solve and the answer cannot be reached only with common reasoning. New information has to be sought in order to understand the nature of the problem and to find ways to clarify the matter. (Hirsijärvi et al. 2007.) Ghauri and Grønhaug (2005, p. 9) state that relevant information has to be gathered and analyzed in order to find the right solution or to answer the questions proposed (Ghauri and Grønhaug 2005, p. 9).

According to Eco (1989, pp. 43-47) research is qualified scientific when it meets the following conditions:

1. The research subject has to be precisely defined
2. The research has to present something new that is not presented before or bring up something new when already known facts are presented from a new point of view
3. The research has to be useful also to others
4. The research has to explain on what grounds the presented hypothesis are right or wrong and thus it has to have all the necessary elements to continue the public discussion about the matter

These four conditions are taken into consideration while conducting this research. The conditions from one to three have been already discussed in the Introduction chapter but they will be amplified in the chapter 6.3.1. so as the condition number four. To be able to meet these conditions of scientific research the research process should be guided with appropriate research design, strategy and methods that are explained next.

There are numerous of different approaches and possibilities to structure a research. The methodological choices of this study are presented in bold in figure 1.1. and they are examined more closely in the following sections.

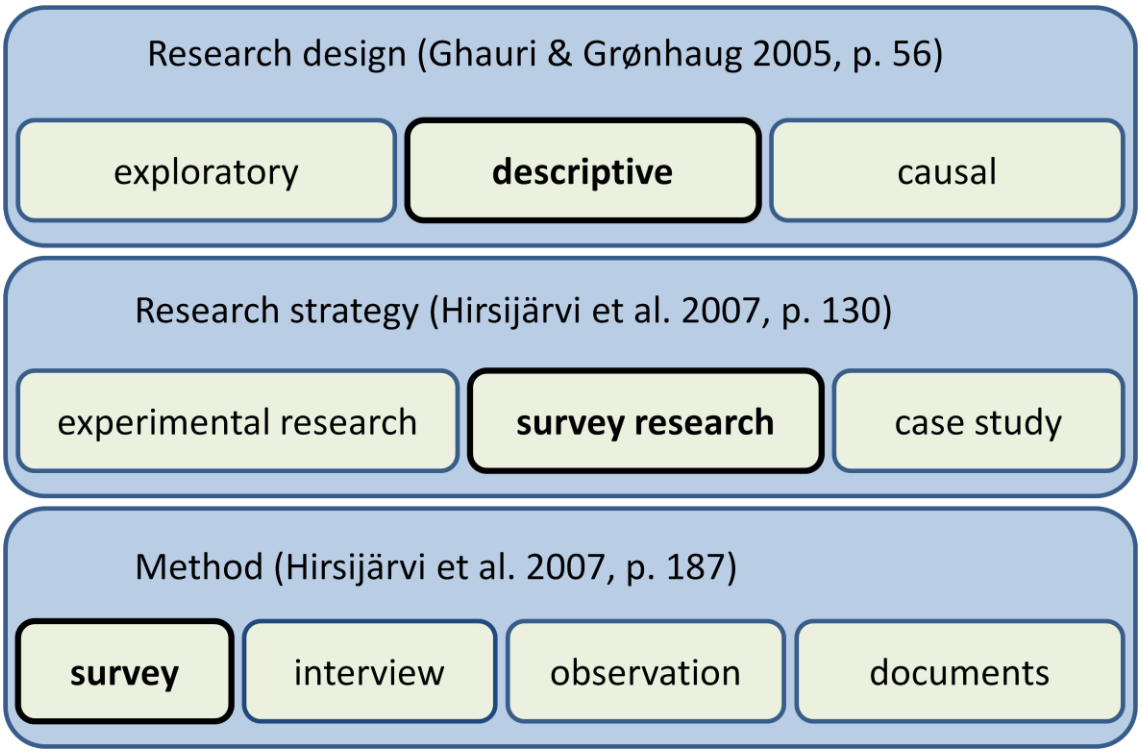

Figure 1.1. *Methodology choices of this study.*

To find a framework for data collection and its analysis a research design has to be determined. According to Ghauri and Grønhaug (2005, p. 56) the research design can be defined as the overall plan for relating the conceptual research problem to relevant and practicable empirical research. Whether the type of research is exploratory, descriptive or causal will be revealed by the research design. (Ghauri & Grønhaug 2005, p. 56.)

Exploratory research is used normally when the research problem is not clearly understood. New pieces of information may change the direction of the study when the overall picture becomes clearer. This is why ability to observe, get information and construct explanation are the key skill requirements in exploratory research. In descriptive research the research problem is structured and unlike in exploratory research the problem is well understood. The key characteristics of descriptive research are structure, precise rules and procedures. Also in causal research the research problem is structured but in addition the researcher is confronted with "cause-and-effect" problems. In this kind of research it is essential to isolate cause(s) and to be aware whether and to what extent cause(s) results in effects. (Ghauri & Grønhaug 2005, pp. 58-59.)

This study is closest to the descriptive research because the research problem presented in the chapter 1.3 is well structured and the key element is not to examine different causes. This study will depend mainly on the empirical part thus a well designed structure, precise rules and procedures play a significant role in this study. The aim of this study is to describe the current business intelligence trends in Finland and thus gain

intelligence and understanding about the matter. This basic idea of the study also supports the choice of descriptive research.

One approach to get a more precise picture about this study is to examine different research strategies. Hirsijärvi et al. (2007, p. 128) states that research strategy is the entirety of the study's methodical solutions. The traditional classification can be made between three research strategies: experimental research, survey research and case study. Experimental research defines a certain sample from the population and analyzes these with specific testing arrangements and in different circumstances whereas case study drills into specific and intensive information about a one certain instance. (Hirsijärvi et al. 2007, p. 130.) Within the framework of this study it is not possible to isolate the sample or systematically change the circumstances thus the experimental research is not suitable solution. Case study does not answer the needs of this research because by concentrating on few case studies the study might not give an extensive understanding to answer the research questions. The best strategy when concerning the research problem is to collect information in a standard form from a defined group of people which is the basic idea of survey research. The aim of the survey research is to describe, compare and to explain a phenomenon (Hirsijärvi et al. 2007, p. 130). In this study the phenomenon will be the current state of business intelligence in Finland.

The chosen research design influences greatly to the type and quality of empirical research. These techniques that are used to collect data can be seen as the research method. (Ghauri & Grønhaug 2005, p. 56.) Hirsijärvi et al. (2007) state that generally a method is defined as a procedure guided by rules. The method is used to pursue and search information and knowledge or it guides to solve a practical problem. Different method options are survey, interview, observation and documents. (Hirsijärvi et al. 2007, p. 178.) According to Ghauri and Grønhaug (2005, p. 124) surveys can refer to the utilization of questionnaire or interview techniques. Surveys allow the collection of a large amount of data from a vast group of subjects in a highly economical way (Saunders et al. 2009, p. 144). In order to reach the aim of the study a large group of companies have to be involved and thus the most suitable method to answer the research questions of this study is a survey (see figure 1.1.). This choice is also supported by the limitations set by the timetable, distances and budget.

To get a more comprehensive picture of the used method it is examined more closely by Maxwell's (1996, p. 65) four main components:

1. The research relationship
2. Sampling
3. Data collection
4. Data analysis

The research relationship is established with those involved in the study to ethically learn the things that are needed to be learned in order to validly answer the research questions (Maxwell 1996, p. 66). In this study the first contact will be done by telephone in order to find the right person to answer BI related questions about the target company. Around 60 people will be contacted, informed about the study and asked to participate in a telephone interview. The survey form will be realized online and send by e-mail beforehand to the interviewees. Because of the substantial number of participants and limited time, the possibility to answer to the survey independently is also allowed. Anyhow, in order to keep the response rate high telephone interviews are preferred. The anonymity of the participants will be respected throughout the study and it will not be possible to identify a certain participant from the findings of the study. After the results are ready there will be a seminar where all the participants are invited to hear the summary of the main results and to receive the research rapport.

Sampling defines what times, settings or individuals are selected to interview or observe. Also the choice about what information sources are used is a sampling decision. To find the information needed to answer the research questions one can select particular setting and persons that cannot be gotten from other choices. This kind of sampling strategy is called purposeful sampling. (Maxwell 1996, pp. 69-70.) In this study it is natural to interview specifically the persons responsible for their company's business intelligence in order to get a comprehensive picture of the state of BI in that company. The subject companies are chosen based on their revenue (top 500 Finnish companies by Talouselämä) and field of business (see the list in the chapter 1.1) Around 10 companies are chosen from each business sector which will mean around 60 companies in all.

Data collection can be done in different ways. In this study the data is collected with structured telephone interviews. Telephone interviews enable relatively cheap way to interview many people within a short time period. Compared to online survey, telephone interview allows interviewees to ask complementary questions if there is for example a term that they are not familiar with. Thus there is not so huge stress put on the question form when there is possibility to give guidance for the interviewees. This was seen one of the advantages also in the former "Top 50" -studies which were all conducted by telephone interviews.

Data analysis defines what has to be done with the information acquired in order to make sense of it. The idea of an experienced qualitative research data analysis is to start the analysis right after the first interview and continue this process throughout the whole study. (Maxwell 1996, p. 77.) In this study each interview session will be registered in the online survey tool called Webropol which enables already some basic analysis functions. The open interview questions are analyzed using Microsoft Office Word and the multiple choice questions using Webropol and Microsoft Office Excel.

In addition to research design and strategy one can examine the purpose of the research from the qualitative and quantitative points of view. There is no need to see these approaches as exclusionary because they can complement each other (Hirsijärvi et al. 2007, pp. 132-134). Also in this study both of the approaches, qualitative and quantitative, can be identified. To answer the research questions a telephone survey is used to catch the "voice" of the subjects. Some of the numerical survey results might be best to present as tables and figures that refers to quantitative research. Nevertheless the main aim is a comprehensive information and knowledge acquisition which is characteristic for a qualitative research (Hirsijärvi et al. 2007, p. 160). More detailed description of the survey execution is presented in the chapter 4.

1.6. Structure of the study

The table of contents on pages iv-v describes the outline of this thesis, which consists of six chapters. In the introduction chapter the background of the thesis and previous studies are presented. The purpose of the study is explained and research questions are formulated. Research design, strategy and methods, that are the basis for the structure of the study, are also described in the introduction.

The following two chapters form the theoretical basis for the thesis. Approaches to business intelligence –chapter gives an overview of the topic by observing business intelligence from different points of view. More attention is given to business intelligence as a process and to the cube of business information because these themes help to understand the empirical part. Business intelligence trends in Finland are discussed in chapter 3. First the definition of a trend is given followed by the former business intelligence trends identified in Finland. Hypothetical trends that are tested in the survey are also presented in this chapter.

Survey execution –chapter gives an overview of the conducted survey. Survey planning and practices are presented and the research data is described. The results of the empirical research and analysis are outlined in the chapter 5. Presented results are following the chronological order of the questionnaire (appendix 1) and comparison to former studies is made during this observation when needed. The discussion of the results is made in the final chapter. Key results and conclusion draw together the theoretical and empirical part. The evaluation of the research is made and further research themes are presented.

2. APPROACHES TO BUSINESS INTELLIGENCE

2.1. History of business intelligence

As already stated in the introduction, business intelligence can be viewed from different points of view. However, the main idea is to manage and enrich business information and to produce up to date actionable knowledge and intelligence for decision making in different managerial levels. In the 80th century it was seen that BI was starting its revolution (Gilad & Gilad 1986, p. 53) and that BI was becoming an essential competitive tool (Ghosbal & Kim 1986, p. 49). According to Tyson (1986) BI is necessary for the companies to be able to survive in the future, but like many new business ideas the general acceptance in the business world was slow. This was the reason why the idea of BI did not spread so quickly in the past. (Tyson 1986, p. 6.) In the 1960s and 1970s the informal BI had been adequate for the information needs at that time (Gilad & Gilad 1986, p. 61) but nowadays with the highly and ever developing technology and rapidly changing business environment the situation is totally different.

From the technological point of view Watson (2005) argues that there have been many changes. The 1970s started with decision support systems (DSS) continuing with executive information systems in the 1980s. In the 1990s and beyond the focus has been on data warehousing and BI. (Watson 2005, p. 4.) This idea is supported by Vitt et al. (2002, p. 24) who state that the BI software industry started its development in the beginning of 90s. Kalakota & Robinson (2000) have also a technical approach when dividing the evolution of knowledge management applications into five waves:

1. Group Memory systems
2. Corporate Intranets & Decision Support Portals
3. Extranets & Interenterprise Portals
4. e-Commerce & Click Stream Analysis
5. Business Intelligence

The evolution has started from the wave one and the waves four and five were the ones ongoing in 2000 (Kalakota & Robinson 2000, p. 352). The needs to use raw data effectively and to convert it into revenue are the reasons behind this evolution (Kalakota & Robinson 2000, p. 351).

The roots of BI could be traced back to military planning and war strategies (Sun Tzu 1988 in Pirttimäki 2007, p. 4.), but today the term is more related to business world

where it is an essential tool in decision making and it seems that the importance of BI is growing strong. This study will give some hints where this development is heading in Finland.

2.2. Business intelligence – the bigger picture

Business intelligence likewise information management, knowledge management, intellectual capital and intellectual capital management can be seen as themes related to a wider concept: information and knowledge management[2] (Lönnqvist et al. 2007, p. 12). The relation of information and knowledge management as an umbrella term to other concepts is presented in figure 2.1. Depending on the definer information and knowledge management can be approached from "the soft side", where the interest lays more on people or from "the hard side", which includes more technical aspects. One other points of view could be to observe the information and knowledge management from different functional levels such as strategic and operational levels. (Lönnqvist et al. 2007, p. 17.)

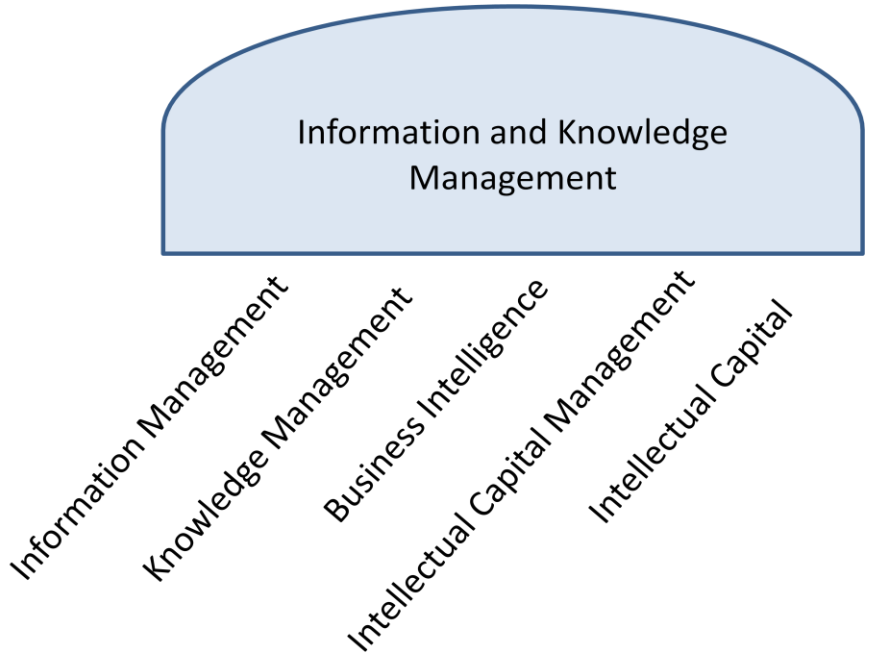

Figure 2.1. *Themes related to information and knowledge management (based on Lönnqvist et al. 2007)*

When discussing information and knowledge management and related concepts, it is quite impossible to avoid the different levels of information summarization. These levels are one of the first steps to understand the concept of information and knowledge management. In the literature the number of levels might vary but normally they are

[2] *In Finnish information and knowledge management is often translated "tietojohtaminen".*

defined as data, information, knowledge and intelligence (see e.g. Thierauf 2001, Davenport & Prusak 2000; Pirttimäki & Hannula 2005). Thierauf (2001) defines data as unstructured facts and figures. Data becomes information when it is structured and interpreted by someone. The higher level after information is called knowledge, which is based on actual experiences and obtained from experts. Intelligence, on the other hand, is applying the information and knowledge to achieve a comprehensive understanding. (Thierauf 2001, pp. 7-9.) Pirttimäki (2007, p. 39) expresses the essence of intelligence by stating that ”intelligence is not only summarized information but also active knowledge of how to apply the content of information”. After defining the different levels of information it is easier to understand the statement of Gilad and Gilad (1986) that business intelligence is a process where the input is raw data and the end result is intelligence.

There are several approaches to understand the meaning of BI and how it should be structured (see e. g. Gilad & Gilad 1986; Pirttimäki 2007). Business intelligence can be referred as a tool, process or a system depending on the definer (see e.g. Goshal & Kim 1986; Gilad & Gilad 1986; Thierauf 2001). These points of view may vary also by the home country and profession of the definer. For example an IT-consultant might find BI same as technical tools and solutions where as someone else might find these technical aspects only one tiny piece of a bigger picture. For example Vitt et al. (2002, p. 13) emphasize the combination of information, people and technology which are essential aspects of BI and help to successfully manage a company. Pirttimäki (2007, p. 91) has identified five most typical viewpoints of BI that are illustrated in figure 2.2.

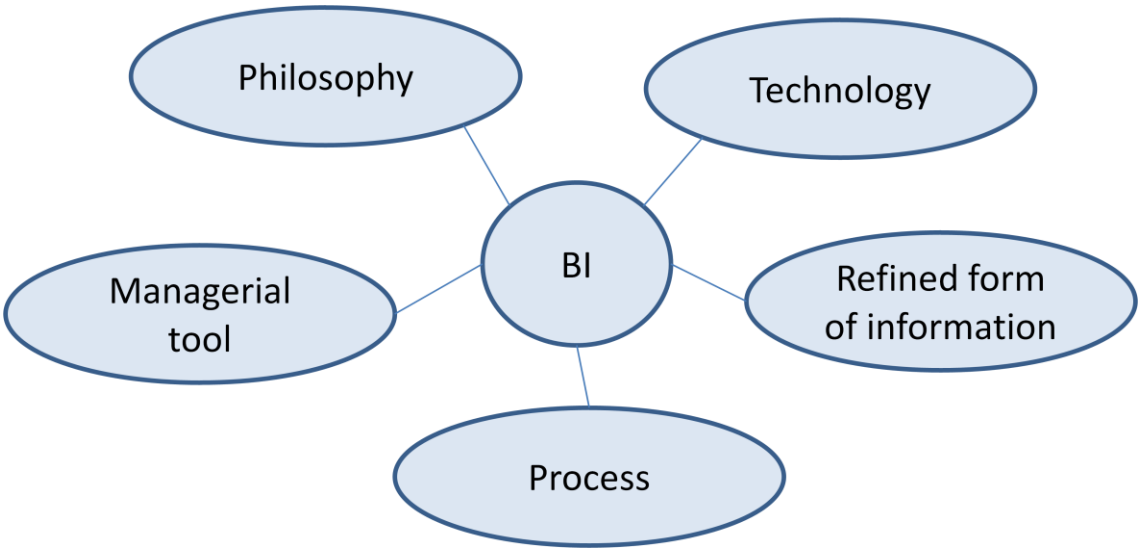

Figure 2.2. *Viewpoints of BI (Pirttimäki 2007, p. 91)*

Philosophy point of view includes the methods and ways of thinking in the BI context. (Pirttimäki 2007, p. 91) Technology is one essential element that enables more efficient BI. The ability to find, accumulate, organize and access business intelligence has been revolutionized by data warehousing, data mining and the Internet (Thierauf 2001, p. xi).

Refined form of information emphasizes the essence of information with its different levels and types. As a managerial tool BI focus on the guidance of management in order to give a comprehensive picture of the company's situation. BI can be also seen as a process where valuable business information is produced. The BI process will be discussed more closely in the chapter 2.4.

As discussed there are many different points of view to examine BI, anyhow the basic idea seems to be the same. BI exists to manage and enrich business information and to produce up to date knowledge and intelligence for decision making in different managerial levels. Business intelligence helps to make better decisions, and what is more, the aim is to make the decisions faster and thus be more agile than the competitors.

2.3. Dear child has many names

Like noted before in this study the term business intelligence is used but it is important to acknowledge that there are several terms used to describe the same or slightly different matter. According to Pirttimäki (2007, p. 60) related intelligence concepts include for example competitive intelligence, competitor intelligence, customer intelligence, market intelligence and strategic intelligence. Normally these other concepts focus mainly on external environment and are seen as subgroups of more extensive term, business intelligence. (Pirttimäki 2007, p. 60.) For example Tyson (1986) states that BI includes following types of information:

1. Competitor intelligence
2. Market intelligence
3. Product intelligence
4. Customer intelligence
5. Technological intelligence
6. Environmental intelligence

This information includes for example competitor's position and intensions, information about the driving forces within the marketplace and about specific products and technology. Also economic, regulatory, political and demographic influences that are external to the marketplace are examined. (Tyson 1986, p. 9.)

There are also approaches that have a specific scope when producing information to decision makers. Accordingly Hedin et al. (2011) the focus of *market intelligence* (MI) is on business environment and how organizations can compete successfully in it. The aim is to collect information about market players and strategically relevant topics and processes. This information is converted into insights that help the decision making. The need for market intelligence strives from the increasingly complex and dynamic operating environment of organizations and the fact that nowadays it is hard to find the

relevant information from the huge amount of data available. Benefits of a systematic market intelligence program are better and faster decisions, time and cost savings, and organizational learning and new ideas. (Hedin et al. 2011, pp. 9-11.)

Competitive intelligence (CI), on the other hand, can be seen as a wider concept than market intelligence. According to Pirttilä (2000) competitive intelligence is a systematic activity which observes the company's competitive environment. All changes and trends in this environment likewise the competitors involved in this environment are essential part of CI. (Pirttilä 2000, p. 186.) Thierauf (2001, p. 206) states that competitive intelligence centers on collecting information outside the company for example information about competitors' strategies, emerging technologies or changes in the market. The main point of competitive intelligence is to make the management level to understand what the company's competitors are doing and how the market is going to evolve. (Thierauf 2001, p. 206.)

Strategic intelligence (SI) is used to make organizational strategic decisions which will help the organization to deal with future challenges and opportunities to maximize the firm's success (Liebowitz 2006, p. 22). SI helps decision makers to understand internal and external business environment and thus make better and faster decisions with confidence (Liebowitz 2006, p. 72). If strategic planning focuses on forming measurable goals from the company's mission, the strategic intelligence centers to see the whole picture and understand where the organization is going today and tomorrow (Thierauf 2001, p. 191). It can be concluded that SI is focused on future oriented decision making on the higher level of the company.

As the presented examples indicate, there are many different terms that are related to the intelligence used in decision making. Pirttimäki (2007) has captured well the relation of these different concepts in a graph that is illustrated in figure 2.3.

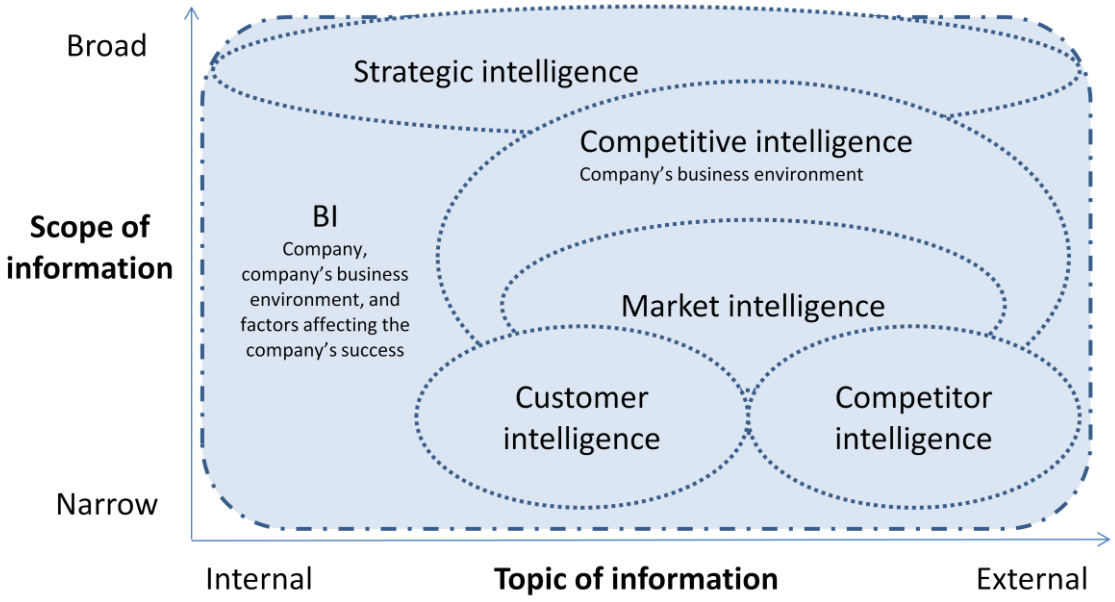

Figure 2.3. *Connections between BI and key intelligence concepts (In Pirttimäki 2007, based on Tyson 1986, p. 10; Fleisher 2001, pp. 4, 7; Choo 2002, p. 88; Fleisher 2003, p. 62; Weiss 2003, p. 49).*

In figure 2.3 the X –axis illustrates the topic of information in the scale from internal and external and on the Y –axis the scope of information is presented from narrow to broad. It can be seen for example that the scope of information of competitor intelligence is quite narrow and the topic of information is focused on external information. We can also see that all these different intelligence concepts can be seen part of business intelligence which includes both internal and external information and approaches the matter from a wider scope of information.

2.4. Business intelligence as a process

As stated also in figure 2.2. the process approach is only one area of BI. However it reveals well the different phases of BI and creates an overall picture of the issues that have to be considered in the companies' BI. This approach also serves well the needs of the empirical study because the survey questions have a link to different process phases of BI. Thus the BI process is discussed in more details than the other areas of BI.

When examined as a process there are different phases that can be identified in business intelligence. Gilad and Gilad (1986) have captured five tasks that BI activities center on:

1. Collection of data
2. Evaluation of data validity and reliability
3. Analysis
4. Storage of data and intelligence
5. Dissemination

Through these tasks raw data can be converted into a form that is valuable to decision makers and can thus help in strategic decision making. (Gilad & Gilad 1986, p. 53.) Also according to Tyson (1986, p. 9) business intelligence is "an analytical process that transforms raw data into relevant, accurate and usable strategic knowledge". Kalakota & Robinson (2000, p. 349) on the other hand state that BI consists of applications which are converting data into knowledge. Even in this approach there are some similarities with the process point of view because these applications consist of five following elements:

1. Data/content organization and collection
2. Analysis and segmentation
3. Real-time personalization
4. Broadcast, retrieval, and interaction
5. Performance monitoring and measurement

With the help of these elements the applications enhance profits in customer service, business planning and business operations. (Kalakota & Robinson 2000, pp. 360-369.)

According to Pirttimäki (2007, p. 72) BI can be seen in a form of a cycle where different activities include acquisition, analysis, storing and dissemination of essential information. Based on this Pirttimäki's (2007) generalization and other BI process approaches (see e.g Gilad & Gilad 1986, Kalakota & Robinson 2000, Fleisher & Bensoussan 2007) it can be stated that in the BI process models the number of phases, structure of cycles and sources of information can vary but in the end the different theoretical BI models are quite similar. Pirttimäki (2007) has summarized well the typical phases of a BI process in five steps that are illustrated in figure 2.4.

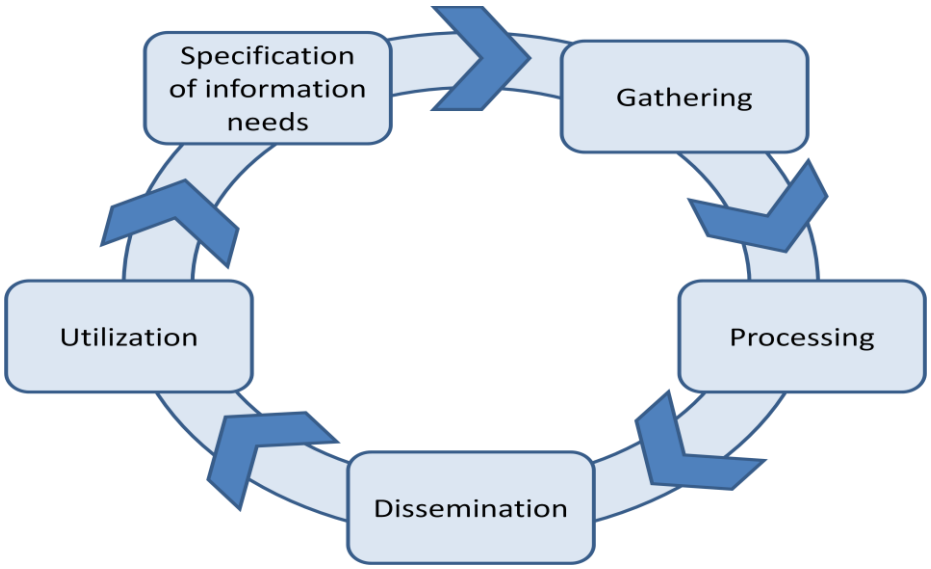

Figure 2.4. *Typical phases of a BI process (based on Pirttimäki 2007, p.74)*

The first phase of the cycle is specification of information needs and the process continues to the direction indicated with the arrows in figure 2.4. After gathering, processing, dissemination and utilization the circle comes back to specification of information needs creating an iterative process.

Specification of information needs is not straightforward because it is difficult to define what information is useful and relevant to decision making (Vitt et al. 2002, p. 15). Key intelligence topics and questions related to issues, problems and trends of that moment have to be cleared in order to specify the information needs (Pirttimäki 2007, p.75). In this observation the different dimensions of information have to be considered. As Hannula and Pirttimäki (2005) state the types of information sources and information subjects can vary from internal to external (see chapter 2.5.). After the cycle has been gone through the specification of information needs should be done again to see if the needs have changed (see e.g. Pirttilä 2000, p. 18).

Pirttilä (2000, p. 18) states that *gathering* phase concentrates on a question, how the information can be gathered as efficiently as possible from different sources that are available. Pirttimäki (2007) states that in this phase it is essential to use the company's internal know-how combined with external information in order to properly understand the external environment. Monitoring the external and internal sources and collecting information from them are the cornerstones of the gathering phase. (Pirttimäki 2007.)

Processing phase includes identification of essential and relevant information and analysis of this information. Based on this identification and analysis the company can tell what this information means for them and for the company's future. (Pirttilä 2000, pp. 18-19.) Also Vitt et al. (2002, p. 16) emphasize the use of organized methods and technologies to analyze the facts that have been collected about the business. Vitt et al. (2002, p. 19) state that challenging the conventional patterns of thinking and assumptions, the analysis helps companies to understand better their business. Fleisher and Bensoussan (2007) state that there are many techniques that can be used in the analysis including for example benchmarking analysis, driving forces analysis and technology forecasting.

According to Pirttilä (2000, p. 18) in the *dissemination* phase it is essential to pass the information to those decision makers that can use it to improve company's business and results. According to Hovi et al. (2001) information can be disseminated in the form of rapports, tables, graphs and ad hoc –queries. Also BI portals, which can be personalized for the users, are used to deliver the information. (Hovi et al. 2001)

Last phase of the cycle is *utilization* where the gathered and processed information is used by the decision-makers and other end users (Pirttimäki 2007, p. 75). Decision making and action tacking should be based on the characteristics of a BI framework (Vitt et al. 2002, p. 16). This well-organized business intelligence provides the company

with clear data, patterns, logic, reporting, graphics and calculation algorithms that can be used further in the decision making process (Vitt et al. 2002, pp. 20-21).

To make sure that the whole process is working as expected all the phases should be planned carefully. Hohhof (2012) states that, if the design or the interpretation of the cycle is not done correctly, there can be problems when allocating funds. Also matching skills and competencies needed to the skills and competencies acquired can be hard if all the phases are not well implemented. (Hohhof 2012.) On the other hand if the BI framework is well planned it helps companies to set their goals, analyze their progress, gain insight, take action, measure their success and start this cycle all over again (Vitt et al. 2002, p. 17).

2.5. A cube of business information

Understanding the BI process and its different phases, described in the previous chapter, gives a general overview of the matter. To deepen this overview a cube of business information should be examined to discover the dimensions of information and to analyze the company's information needs. This examination gives also good basis for the empirical part of the thesis where the segmentation to internal and external business information can be detected.

As stated already in the chapter 2.2. different levels of information are categorized into data, information, knowledge and intelligence. According to Hannula and Pirttimäki (2005) more detailed grouping is needed when identifying information needs. These three dimensions are as follows:

- The source of information: inside or outside the organization
- The subject of information: inside or outside the organization
- The type of information: quantitative or qualitative

This categorization can be described also in a form of a cube that is presented in figure 2.5. The X-axis consists of internal and external information source, Y-axis defines as internal and external information subject and the Z-axis describes qualitative and quantitative information types.

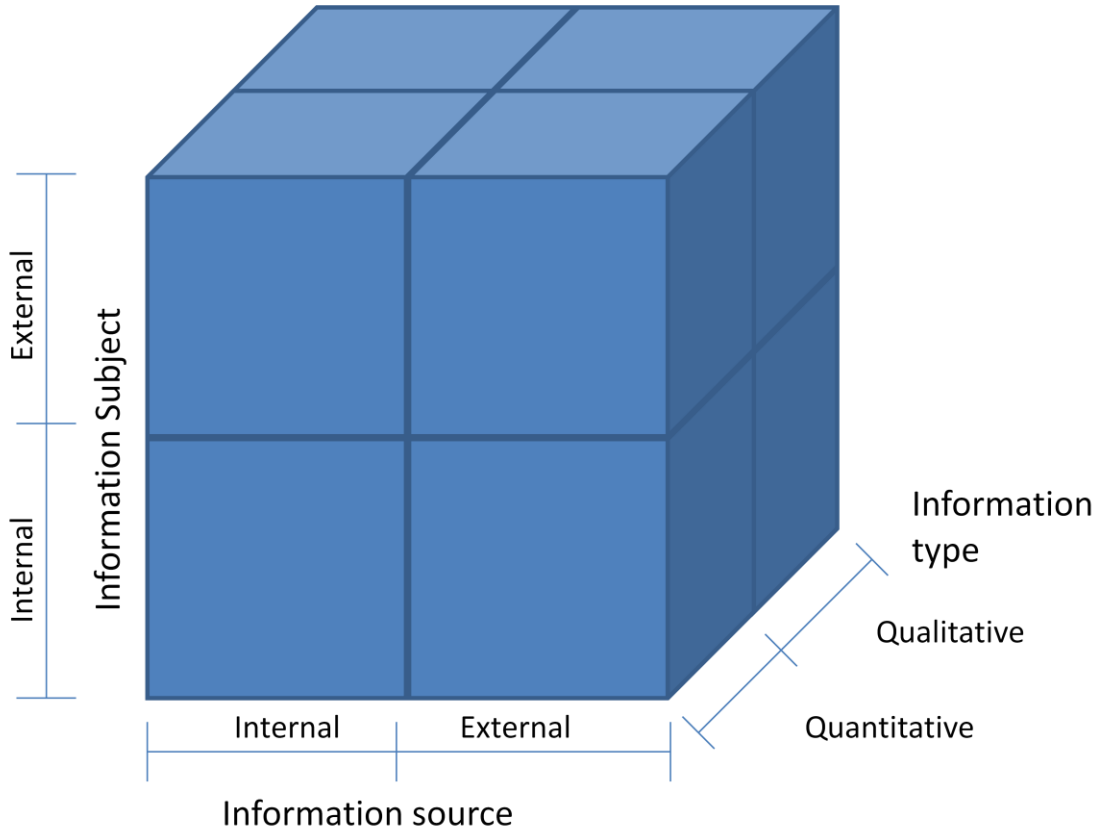

Figure 2.5. *The cube of Business Information (Hannula & Pirttimäki 2005)*

According to Hannula & Pirttimäki (2005) in order to do effective business decisions both qualitative and quantitative information are needed. Quantitative information is for example statistical analysis based on numerical sales data. Qualitative information is needed for example when decision making needs vision and insight in determining personnel needs in a 10-year-scale.

Competitors are a good example of subjects of information that are located outside the organization. Pirttilä (2000) states that colleagues inside your own company are one of the most important source of information when information is needed about the competitors (Pirttilä 2000). In this case the subject of information is external but the source is internal. Pirttilä (2000) continues that when collecting competitor related information important sources are news services, customers and annual reports published by the competitors (Pirttilä 2000). This time both the subject and source of information are external.

The information needed can be also located in different information systems and tools. According to Davenport and Harris (2007) the use of analytical tools can be divided into internal and external. The external systems are dealing with customers and suppliers where as the internal systems are related to finance, production, product development and personnel. (Davenport & Harris 2007.) This grouping is following the division of

information subjects. Nevertheless the information that is processed using these tools is probably located in the company's databases and thus the information source is internal.

3. BUSINESS INTELLIGENCE TRENDS IN FINLAND

3.1. Definition of a trend

In Oxford dictionary (2013) the word trend is defined as "a general direction in which something is developing or changing". Cornish (2004, p. 22) is referring to trend as currents of change and Kotler (2012, p. 98) sees trend as a direction or sequence of events with momentum and durability. Trends should not be mixed with fads that are unpredictable and short-lived. Unlike trends, fads have no social, economic or political significance. (Kotler 2012, p. 98.) Chat rooms, hip hop fashion and tamagotchies can be seen as fads of the 90's (CrazyFads 2013) whereas an example of a trend, that has changed the business world, is the technological revolution of the late 19th and early 20th centuries (Kalakota & Robinson 2000, p. 34).

According to Naisbitt (1982, p. 9) trends can tell the direction the country is moving in. Also Cornish (2004, p. 37) sees the possibility to predict the future with trends when referring trends as "bridges from the past to the future". With the help of trends it is possible to convert knowledge of what has happened in the past into knowledge about what might happen in the future. (Cornish 2004, p. 37.) Kalakota and Robinson (2000) state that trends are global and that they last from 5 to 10 years (Kalakota & Robinson 2000, p. 33). Naisbitt and Aburdene (1990, p. 12) have identified also megatrends that are seen to be big social, economical, political and technological changes that are evolving slowly. Once these megatrends have born they effect on us from seven to ten years or longer. (Naisbitt & Aburdene 1990, p. 12.) Megatrends reflect the characteristics changes of a decade thus they are not something that just quickly passes by. (Naisbitt 1982, p. 9.)

Different kind of trends for example cultural trends, market trends or fashion trends can be identified observing the surrounding world. This identification can be done in different ways. According to Cornish (2004, p. 39) some of the most useful trends are actually indexes. We can get useful information when combining a number of different trends into single overall measure. (Cornish 2004, p. 39.) For example nowadays it is possible to analyze phenomenon using the number of Google searches in Google trends (see e.g. Google Trends 2012; Yossi 2012). Business activity is another example where leading economic indicators are followed in order to see if the business activity will grow or shrink in the coming month (Cornish 2004, p. 39). If statistics are available for a trend, extrapolation allows us to anticipate a future condition. With this technique

statistics are graphed to show how the trend has evolved over time with further analysis of its direction and speed. (Cornish 2004, p. 86.)

The will to understand the future, the urge to achieve certain goals and the fear of being left behind are drivers which make individuals and organizations value the understanding of trends. Practical judgments about one's goals and strategies can be made based on knowledge of significant world, national, and regional trends. (Cornish 2004, p. 90.) Naisbitt (1982, p. 9) states also that once making a decision that is compatible with the overarching trend, this trend can help you along. As already stated before, trends give information about the future and thus they are a valuable asset in making practical decisions in our work and other activities (Cornish 2004, p. 37). In problem solving, trends help us to organize our thinking about the changes and simplify the picture of what is going on. This way we can recognize the key insights about the matter and make problem solving easier. (Cornish 2004, p. 43.)

When using trends to achieve something, it is important to remember that no trend continues forever. Like Cornish (2004, p. 37) states every trend will slow, halt or reverse. Kalakota and Robinson (2000, p. 33) argue also that trends can evolve dramatically. Even the long-term trends cannot be trusted although, the longer the trend has lasted, the more certain we can expect it to last a little longer (Cornish 2004, p. 37).

In this study one of the goals is to find trends that are currently influencing on the business intelligence sector and to predict trends that might be important also in the future. If direction or sequence of events is identified based on literature, other secondary sources or the empirical study of this research, it will be considered as a trend in this study. When identified, these trends can help the business intelligence sector to predict the future more reliably and guide organizations to do better decisions concerning their business intelligence.

3.2. Former business intelligence trends identified in Finland

Based on the definition of a trend given in the chapter 3.4., it is difficult to say when a trend has passed and it is not influencing any more. This is perhaps something that can be seen only after a decade or more. Never the less, examining the BI trends that have been identified in the former studies, literature and other sources can tell us something about the current and possible future trends. Next some BI trends identified in the former "Top 50" –studies are discussed.

According to the precious studies, concerning the state of business intelligence, there were several recognizable BI trends in top 50 Finnish companies. The study conducted in 2002 showed that almost 95 percent of the companies believed that the importance of BI –activity will be emphasized in the future (Pirttimäki & Hannula 2002, p. 49). This

idea was supported by the study in 2005 which stated that business intelligence will be activity practiced in all the large companies. Also the direct investments in business intelligence were seen to rise slowly and to approach the optimum point at the same time. (Koskinen at al. 2005, p. 34.) In 2007 it was noticed that compared to the year 2005 the most important information need was no longer the own business sector related information but the information about the competitors. This indicated that the focus of BI had shifted towards following the competitors. It was also stated that BI is a tool in strategic work almost in every Finnish large company because long-term analysis were made in 88 per cent of the companies. (Halonen & Hannula 2007, p. 42.)

The "Top 50" study in 2009 revealed that the importance of customer information was emphasized along the competitor information. Because of the economic situation the information related to customers and their business field was found more important than earlier. The long-term analyses were also gaining more popularity along the short-term monitoring. Likewise new technological solutions were seen more popular in the delivery of information products. One important target for development in BI was seen to be the better and more extensive use of the systems and their integration with each other. (Vuori & Hannula 2009, p. 28)

These trends that have been indentified in Finland during the past ten years can help us identify and understand the trends that are influencing the BI sector at the moment and in the future. The former studies and their trends are used as a stimulus in this study to find the current and possible new trends in the BI sector in Finland.

3.3. Possible trends related to business intelligence

Before the actual survey was carried out, literature, news archives and informal interviews with colleagues were used to identify possible trends affecting on the business intelligence sector. These hypothetical trends were sought in order to get a wider view of the topic and to be able to test these findings in the survey.

Different online news archives like Talouselämä, Tietoviikko, Kauppalehti and Tekniikka & Talous were used to pinpoint "hot" topics related to business intelligence and topics parallel to it. Search words used in the process were for example: "*liiketoimintatiedon hallinta", "liiketoimintatieto", "business intelligence", "BI", "kilpailijaseuranta", "competitive intelligence", "CI", "market intelligence", "MI", "markkinaseuranta", "trendi", "tiedolla johtaminen"* and *"analytiikka"*. To keep the amount of news rational and the content fresh the main stress was on news published from 2010 onwards. The focus was on Finnish news but some of the news led to international publications that were referred in the text. Also these global hints of possible trends were taken in to account because geographical borderlines are not a barrier in today's world thanks to advanced information technology and good travelling possibilities. For example Pieschel (2012) states that especially mega trends are

applying globally and that they should be recognized in order to have a long term perspective in the companies.

This preparatory trend identification revealed different kind of possible trends that were divided into three different groups of data features, technologies and supporting activities and new ways of working. All the identified hypothetical trends are listed in table 3.1.

Table 3.1. *Hypothetical BI trends identified in Finland in 2013*

Data features	• Big data • Open data • Real time data • Analytics
Technologies and supportive activities	• Mobile technology • Cloud computing • Social media • Usability of information systems • BI is merged to everyday working methods and tools • Information security
New ways of working	• BYOD • BI is brought closer to bigger user groups • BI is used throughout the organization

The sources used for the trend identification might have reflected too much of the media's point of view. Thus it has to be emphasized that these groups consist of *hypothetical* trends and that they have to be exploited and tested in the empirical part in order to show their actual meaningfulness. These possible trends of data features, technologies and supportive activities and new ways of working are discussed in more detail in the following subchapters and tested in the empirical part of the study.

3.3.1. Data features

The amount of unstructured and unanalyzed data is growing continuously. During the news review different forms of data were mentioned in many articles. *Big data*, *open data* and *real time data* likewise the possibilities that these data features enable were popular topics. *Analytics*, that offers ways to refine data, was also mentioned often linked to different data features.

Big data can be understood better through velocity, volume, variety and complexity of data. All these elements are growing and thus creating situation where data is challenging to manage, analyze and interpret. Lukawiecki (2013) gives an example that big data can be used in telecommunications to optimize the network performance and thus develop the network failure prediction. It is important to remember that today's big data is tomorrow's little data, meaning that complex data is not complex if the current capabilities are right. (Lukawiecki 2013.) From this point of view big data has always existed because it is only a question of the complexity and amount of data versus the

methods, tools and analyze capacity that are available at that moment. It might be that big data is just a new term to something that has already been influencing the business intelligence world from the beginning. For example Sallami states in Pervilä's (2012a) article that big data is not replacing business intelligence but improving the BI-tools. Lindgren (2013) sees that with the help of big data functionalities data in the information systems can be analyzed in more details. This helps the companies' management to get more precise information about their business and its development. (Lindgren 2013.)

Open data refers to unprocessed data that has been cumulated for public administration, companies, organizations and private persons, and that has been opened for public for free. The state how open the data is can be evaluated with different metrics: technical availability, gratuitousness, terms of use that allow the reuse, visibility and intelligibility. (Helsinki Region Infoshare 2013.) Finnish open data sources, published by the public administration, are gathered in "Avoin data" –webpage (Suomi.fi 2013). According to Jouslehto (2012) location intelligence is one of the BI-trends identified by Gartner[3] and that open data brings many possibilities on this field.

Real time data is immediately available data about company's business that helps to speed up the decision making process with up-to-date data. Nowadays many companies understand the importance of processed and analyzed data and that it has strategic value especially if it is accessed real time (Kauppalehti 2011). Information technology offers different possibilities to manage real time data. For example in 2011 SAP launched new versions of BI-tools that include real time activities and enable to access BI-information at any times (SAP Finland Oy 2011). Gartner's study reveals that business intelligence is one of the main priorities for chief information officers. Growing interest towards BI-sector is supported especially by the new possibilities that big data and real time data enables. (Vänskä 2012.)

When velocity, volume, variety and complexity of data are growing also the importance of different techniques and tools to manage this data evolves. *Analytics* rests often on information technology tools and methods that help to analyze the mass of data in order to help decision making processes (Davenport & Harris 2007). According to Kohavi et al. (2002) the general process of exploration and analysis of data is called analytics when the aim is to discover new and meaningful patterns in data. Examples, where analytic tools can give business more insight are sales, marketing, supply chain visibility, price optimization, and work force analysis. (Kohavi et al 2002.) Some times the term proactive analytics is used when the aim is to emphasize the future oriented point of view. Ruponen (2012) states that proactive analytics can help to predict development in short and long term and optimize processes. Pervilä (2012a) sees also the potential in proactive analytics. He predicts that in the near future, due the

[3] *The original source could not be accessed.*

technology development, the sales and customer service personnel can make better and faster decision thanks to proactive analytics. (Pervilä 2012a.) Helkiö (2012) acknowledges that the use of proactive analytics is based on business related questions often linked to numerical prediction and segmentation. In this case the aim is also to optimize the activity in question and to gain better performance.

3.3.2. Technologies and supportive activities

Mobile technology, *cloud computing* and *social media* are often recognized as ongoing general trends. These themes are getting popular also on the BI sector likewise the *usability of information systems* and how *BI functions are getting closer to everyday used working methods and tools*. However, it has to be remembered that new technologies can bring new *information security threats*.

Devices that use *mobile technology*, like mobile phones and tablets, are starting to be part of our everyday life at home but also at work. Mobile applications and the use of mobile devices have been seen as a growing trend in different studies (see eg. Pervilä 2011, Storås 2012a, iProspect 2012). In 2012 iProspect published a research focused on Western Europe which stated that 64% of the participants felt like they were "always connected" to the Internet. In Sweden only small majority preferred to use desktops instead of smart phones at work. (iProspect 2012.) The pressure to be able to use programs on mobile devices can be seen in new versions of software tools that enable to use BI related information in all mobile environments (see eg. SAP Finland 2011, IBM 2011a, Cision Tiedotepalvelu 2012a). This kind of new mobile services, applications likewise new smart phone features and different sized tablets are improving productivity and user experience (Cision Tiedotepalvelu 2012b). The use of mobile technology brings us closer to the information where ever we are. One negative side that has to be considered are the new information security risks that the use of mobile devices can bring (IBM 2011b).

Cloud computing, that includes cloud services, is a model for enabling network access to a shared pool of configurable computing resources. The service models can be divided into three groups: Saas (Software as a Service), IaaS (Infrastructure as a Service) and PaaS (Platform as a Service). (Mell & Grance 2011.) In different sources cloud computing has been recognized as one of the technology trends that are shaping our lives (see eg. IBM 2011a, Cision Tiedotepalvelu 2012c, Hänninen 2012, Storås 2012a, Siltala 2013). According to the Cisco GCI -study already 52% of information processing is taking place in the cloud in 2014 (Cision Tiedotepalvelu 2012c). In business intelligence cloud computing can bring an advantage especially if companies want to analyze huge data masses. Cloud computing enables to use infrastructure for this analyze only when you need it and thus the investments are smaller (Siljamäki 2010). Also the software providers are offering new tools that are based on cloud

services (see eg. Solteq Oyj 2012, Pervilä 2011). When cloud services are taken care of another party information security, availability and capacity can cause issues as these features are no longer internal part of company's own IT-organization (see eg. Siljamäki 2010, Pervilä 2012b, Pervilä 2012c).

Social media has reached a solid position in our society. According to a study conducted by Itella, social media serves our daily communication needs and offers more efficient tools to carry out these needs (Itella 2012). Companies' visibility in social media can be important part of their brand, and it can be also used as a source of business information (Storås 2012b, Ixonos Oyj 2012). Social networking services such as Facebook contain data that can include information about customer behavior, customer experiences or tells how successful a marketing campaign has been. The mass of data that social media produces includes text, pictures, videos and links. This kind of data in multiple forms is hard to analyze, but there are already some tools that can help to identify the important information from the data flow (Solteq Oyj 2012, Nikku 2012). Social element, that enables communication with other users, information sharing and virtual collaboration, is already influencing the functionality of BI-tools and applications (SAP Finland Oy 2011, IBM 2011a, Ixonos Oyj 2012). This way social media can be used for example to open the decision making process and let more people to express their views (Mäntylä 2010).

New technology and devices enable faster and easier way to manage information, but this advantage gives an opportunity also to criminals. Global information security company Kaspersky Lab has predicted the most essential *information security* threats in 2013 including cyber-espionage, attacks against cloud services and mobile malware. (Kaspersky 2012; Cision Tiedotepalvelu 2012d.) New kinds of information risks have to be faced for example because of the growing use of own mobile devices at work. Normally the problems are caused by the component manufacturers that do not publish the security updates on time (IBM 2011b). It is essential to make sure that the information is available only to whom it belongs to, it is not damaged or manipulated on the way and that the information can be accessed when needed. Business information is often sensitive and thus the availability, integrity and confidentiality of the information cannot be risked.

Good usability is gaining more and more attention because effectiveness, efficiency and satisfaction are nowadays valued features in all systems and devices. Lack of IT-skills should not be a barrier between people and business information when devices and user interfaces are well designed. For example Ollila (2011) states that old enterprise resource planning systems, which contain important business information, are not easy to use. The poor usability can complicate the implementation of the systems and also reduce the actual use. (Ollila 2011.) Everyday used tools like PowerPoint and Excel have been developed to include more features to understand company's business better especially when it comes to handle huge amounts of data (Lukawiecki 2013, Siltala

2010). When *BI is merged to everyday working methods and tools*, it gets closer to all employees and is not used only by the top management. For example BI-guru Elliot states in Siltala's (2010) article that better decision can be made when more people can be involved in the decision making process.

3.3.3. New ways of working

New technologies and general development are generating also new ways of working. Devices are nowadays easy to carry and take with you where ever you go, also to work. Devices, programs and applications that are used in private life are more and more eagerly applied also at workplaces. This phenomenon is called *BYOD, "bring your own device"* and it is speeded up with cloud services because the accessibility to information is no longer tied to specific devices. (see eg. Hänninen 2012, Cision tiedotepalvelu 2012b, Hartig 2012.)

When business information is effortless and faster to access BI becomes easier part of everyday working. *BI can be brought closer to bigger user groups* when BI process is done more openly and information is shared on every hierarchical level for example with personalized platforms. BI solutions can bring advantage for middle management, for sales personnel and even in some cases for customers (Kaartinen 2011). BI does not have to be only managerial level tool but it can be integrated to company's different sectors. The aim seems to be that *BI is not used only in one part of the company but throughout the whole organization*. Especially co-operation between IT administration and financial administration can produce demanded synergy advantages (Oksanen 2010).

4. SURVEY EXECUTION

4.1. Survey planning and practices

The starting point of this study was the co-operation between Department of Business Information Management and Logistics (TUT) and KPMG Oy Ab and the desire to understand better the business intelligence trends in Finland. As stated in chapter 1.5. survey was the best method to answer the following research questions presented in chapter 1.3.:

- What is the state of business intelligence in companies operating in Finland in 2013?
- What are the main trends affecting on business intelligence field in Finland?

The planning of the survey started in December 2012. The questionnaire was prepared in several meetings in co-operation with the participating research parties. The questionnaire from the research made in 2009 was used as a guideline and it was revised to meet the goals of the study in 2013. The literature review and hypothetical trends that were identified in the theoretical part of this thesis were applied in the questions. Like in the earlier studies mainly multiple-choice questions were used but open questions were applied in some parts to get a more comprehensive overview of the topic. The aim was to maintain the comparability to former studies as well as possible. Only one question from the 2009 survey was discarded and other questions were modified. Also some new questions were added and the structure of the survey was reorganized. Because of these modifications the length of the survey grew compared to former survey forms.

The survey was conducted in the spring 2013. Almost every participant was interviewed by telephone. One interview was made face-to-face and eight participants answered the questions online by themselves. One telephone interview took normally 30 to 60 minutes. The questionnaire (appendix 1 in Finnish and appendix 3 in English) and covering letter (appendix 2) were originally written in Finnish. The documents explained the main points of the research and used terms and they were sent by e-mail to the interviewees beforehand. Almost in all cases the participants were already contacted by telephone or e-mail before getting these documents. During the interviews the interviewer marked and typed down the answers directly to online questionnaire that was realized with Webropol survey tool. The same tool together with Microsoft Excel and Microsoft Word were used to analyze the results.

4.2. Description of the data

The aim of the study was to get 60 participants equally from different industries. The number of the companies contacted was 96 and from those 56 companies participated in the survey. Thus the response rate of the survey was 58%. The subject companies were divided into seven different groups by their industry (see table 4.1.). In the former studies the response rate has been 92% in 2002, 82% in 2005, 96% in 2007 and 64% in 2009. It has to be noted that the response rate in 2013 is not comparable to the former response rates because the sample was different. In this study the amount of participants was higher than in any of the former studies. The scope was not anymore the top 50 largest companies but the participating companies were chosen from the top 500 companies. Thus it was possible to contact companies from a wider set. After reaching the 56 subject companies it was seen that the collected material was extensive enough for the purposes of this study.

Table 4.1. *The industry of participating companies*

Industry	**The number of companies**
Energy	6
Real estate and construction	7
Consumer goods and commerce	8
Banking, financing, insurance business and administration of property	7
Information technology, media and telecommunications	9
Manufacturing industry	13
Other[4]	6

The contacted companies were chosen by their revenue. This examination was based on Talouselämä's (Finnish business magazine) list of 500 biggest companies operating in Finland in 2012 (Talouselämä 2012). The main stress of the participants stayed in the head of the list because from the 56 participants 27 belonged into top 50 biggest companies and 38 to top 100. Almost all of the participants (51 companies) were included in the 300 biggest companies listed by their revenue. The interviewees were mainly managerial level persons or higher level officers from BI-, financial- or IT-sector (titles included for example Chief Financial Officers, Development Managers, BI-managers, Group Controllers, Business Controllers and Group IT Managers).

When the answers are being analyzed it has to be kept in mind that the response rate is not the same in all of the questions. Interviewees left some questions unanswered for understandable reasons. For example if the interviewee's role was more on company's internal business intelligence the questions concerning the external BI were left aside. Also the field of operation affected the answers because in some cases the companies

[4] *The group "Other" includes companies from the field of consumer services, company services and logistics.*

did not have all the operations mentioned in the question or the options were not relevant in other ways. In the results this is indicated as the sample size (N).

5. RESULTS OF THE EMPIRICAL RESEARCH

5.1. Specification of the activity

After the background information, in the third question (question 3, appendix 1) the respondents were asked, if they have consciously organized activities to gather and analyze information about their company and the external business environment. All the participating companies (100%) could recognize this kind of activity. Based on the results from the former studies, this percentage has increased during the 21st century and reached its top in 2009. Table 5.1. provides an overview of the development.

Table 5.1. *Companies that have consciously organized intelligence activities*

2002	**2005**	**2007**	**2009**	**2013**
80%	95%	98%	100%	100%

The aim of question 4 (appendix 1) was to prepare the respondents for the questionnaire by asking, what are the most important ways and tools to keep the company's management up to date of the company's situation. Probably because of the open ended nature of the question some of the answers were given from a general point of view where as some of the questions went to detailed level. Also the terminology might have varied between different companies even though the main topic has been the same. Nevertheless, themes like reporting, information system solutions, metrics and surveillance, forecasting, interaction, information collection related to competitors and customers and other services (e.g. news and market surveillance) were recognized.

The most common answer that appeared in 66% of the answers was reporting. On a general level reporting, reports and report solutions were mentioned but also more specific terms such as financial reporting, management reporting and outcome reporting were pointed out. In some cases the reporting was based on a portal solution and in some companies the reporting was linked to companies' information systems and databases.

Information systems were mentioned also in other contexts. For example enterprise resource planning systems (two mentions), customer relationship management systems (four mentions) and data warehouse solutions (four mentions) were seen important tools to keep the company's management up to date. More general terms such as information systems and operative systems were used in seven answers. Tools like BI-portal, BI-system and BI-platform were also mentioned.

Different metrics and surveillance were also seen as important elements from the managerial point of view. In more detail, metrics for service processes, key performance indicators, balanced scorecard –approach, market specific numbers and surveillance in legal, political and social matters appeared in the answers. Also surveys focused on the personnel were evaluated by the companies. Metrics were used in different time periods such as one year, half of a year, one quarter and one month. Forecasting and predictions were also one theme in the answers that were mentioned four times.

It seemed that the competitor and customer related information was essential to managerial level. Competitor surveillance and competitor analysis were applied and for example annual reports of the competitors were exploited to gain information about the competitors. Customer related information, customer behavior, customer surveys and customer satisfaction metrics indicated that customers were also one focus point when keeping up to date about the company's situation. Companies were also using other methods that included for example benchmarking, external consulting and researches. News portals, news reviews and media surveillance likewise market analysis, market review and market information services were told to be applied. In some answers ad hoc –reports and other case specific analyses were used.

To keep the managerial level up to date, interaction inside the managerial level and between all the employees was seen necessary. The gatherings of the executive group, surveillance meetings and networking with colleagues were mentioned as important activities. In one answer it was stated that the information is transferred onwards from the lower hierarchical level to the upper level through daily working. Subordinates were seen as important information source also in another answer where information was disseminated in meetings and control groups. Also unions related to the industry were mentioned as a good information source.

In the questionnaire the Finnish term "liiketoimintatiedon hallinta"[5] was used to describe the collecting and analyzing of information from internal and external sources. Question 5 (appendix 1) aimed to reveal what kind of terms were used in the subject companies. The answer options were business intelligence, competitive intelligence, "liiketoimintatiedon hallinta" (eng. management of business information and knowledge or business intelligence), market intelligence, "tiedolla johtaminen" (eng. management with knowledge) and supplementary choice that could be specified by the interviewee. Popularity of the terms is illustrated in figure 5.1.

[5] *The term "liiketoimintatiedon hallinta" was used for the first time in the "Top 50" -study in 2002 to describe business intelligence in Finnish because there was no other established term for the matter in Finnish at that time.*

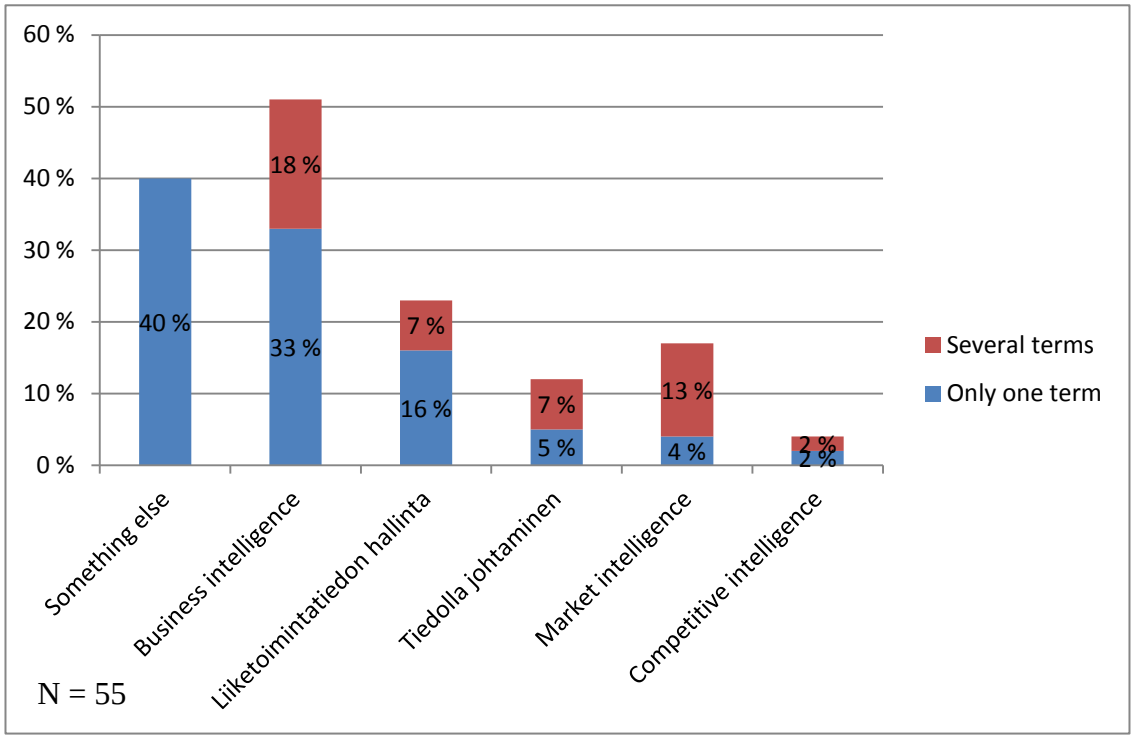

Figure 5.1. *Used terms about the activity*

In figure 5.1. blue color indicates the amount of companies using only one term for the activity and red color indicates the amount of companies that are using the term in question together with other terms. The percentages indicated in red were mentioned in the option "Something else". From the respondents 13 mentioned that there is more than one term in use for the activity. Normally the used terms were from the list given in the question. In these answers business intelligence was mentioned ten times, market intelligence seven times, "liiketoimintatiedon hallinta" four times, "tiedolla johtaminen" four times and competitive intelligence one time.

Eight of the respondents informed that there is no established term for the matter in the option "Something else". Other terms outside form the given list were management reporting, customer insight, market insight, "toimintaympäristön seuranta" (eng. operational environment surveillance), raportointi (eng. reporting), control function, markkinatiedon hallinta (eng. market information management), information management and finance and control reporting. The terms were used depending on which department was in question or what was the point of view. For example one interviewee told that activities related to internal business information were called business intelligence and activities related to external business information were called market intelligence.

In 2009 business intelligence was the most popular term with 56%, second popular was option "Something else" with 34%, third competitive intelligence with 6% and fourth

"liiketoimintatiedon hallinta" with 3%. Compared to the former studies the terminology seems even more fragmented. This might be explained partly with the fact that the answer options were increased. When the list had more options (4 in 2009 and 6 in 2013) the answers were also spread among these options. The decrease in the popularity of the term business intelligence can be understood better if the answers in the "Something else" –option are observed. If these answers are also included, business intelligence is mentioned in 51% of the answers (see figure 5.1.). Substantial increase could be seen in the popularity of the term "liiketoimintatiedon hallinta" that grew 13 percentage points.

5.2. Organization of business intelligence

In question 6 (appendix 1) the subject companies were asked if they have a separately defined strategy for business intelligence. A separate strategy for BI could be identified from 31% of the companies. Negative answers (69%) were explained normally by stating that the BI strategy is spread in other strategies. For example IT-strategy, information systems strategy and customership strategy could include BI related matters. In some cases business intelligence activities had a plan of actions but an official BI strategy could not be identified. In 2009 from the respondents 47% had a BI strategy, which is 16 percentage points less than in 2013. It has to be pointed out that in 2009 the question asked generally if the company had a BI strategy and did not specify that it had to be a *separate* BI strategy.

Appearance of a BI strategy is varying in different industries. As it can be seen in figure 5.2., most often the BI strategy is prepared in consumer goods and commerce, where 50% of the companies have a separate BI strategy. The other end is energy field where only 17% of the companies have a BI strategy.

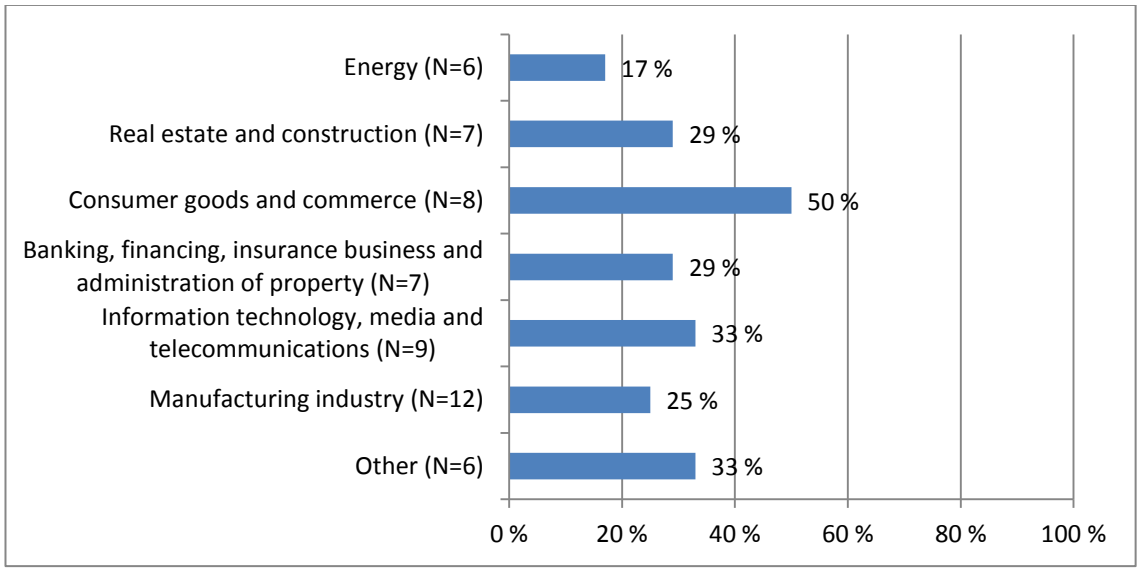

Figure 5.2. *Companies that have a separate BI strategy in different industries*

In question 7 (appendix 1) was enquired if the internal and external business intelligence have a main responsible person. The terms internal and external business intelligence were explained in the cover letter (appendix 2). In the response options it was assumed that either one person is responsible for both of the tasks, or there are separate persons assigned for external and internal BI. If the situation was neither of these the answer was negative and it could be supplemented with an explanation. The answers are illustrated in figure 5.3. The answers were also asked to be clarified with the titles of the correspondent(s). In some cases this was difficult, because the titles were not always remembered and the person could be only located to certain department (for example IT administration).

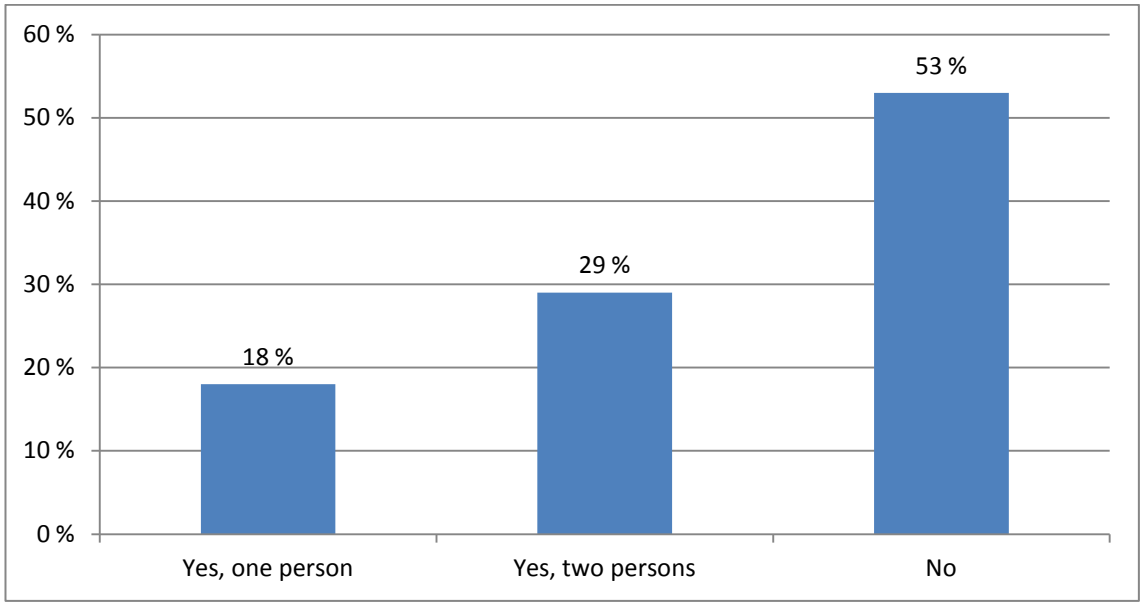

Figure 5.3. *Is there a named person(s) responsible for internal and external business intelligence?*

Minority of the companies (18%) had one person responsible for the BI. In these cases the title of the correspondent was for example chief financial officer, chief development officer, BI-manager and customership manager. In 29% of the companies there were two correspondents for the activity. The responsible persons of internal BI were for example business controllers, head controllers, chief financial officers and chief technology officers. Titles for the external BI correspondents were for example development manager, BI-manager, market insight manager and financial manager.

As seen in figure 5.3., most of the companies (53%) do not have one or two responsible persons for the business intelligence. The common reason why the activity did not have a named correspondent was that the responsibility was fragmented. There might have been more than two persons responsible or the responsibility was pointed to a larger element such as a specific control group or the management group. In some cases the responsibility was divided by organizational departments and in some cases by business

areas. Some respondents emphasized that the activity itself had no correspondent but the used mechanisms and tools have. Negative answer was given to question 7 also if internal or external activity had a correspondent but the other function's responsibility was fragmented. In some companies no distinction was made between internal and external business information but for example operative information and financial information were seen separate entireties.

In question 8 (appendix 1) the respondents were advised to define, whose subordinates the BI correspondents (named in question 7) are. If there was only one person responsible, normally he or she worked under chief executive officer, chief financial officer or strategy manager. If there were two persons responsible, the internal BI responsible worked for example under chief financial officer, business controller, ICT-service manager or member of the management group. The responsible for the external BI worked for example under chief executive officer, vice president, strategy manager or member of the managerial group. The respondents, who had defined the responsibility in another manner, said that the responsible works under chief executive officer, business unit director, chief financial officer or member of the managerial group. In question 8 it was also asked to define the department where the person was working. Regardless what the answer in question 7 had been normally the person working above the BI responsible was told to work at the financial department. Departments like marketing, business development, business planning and strategy department were mentioned. In some cases the department could not be defined (for example for the members of the managerial group).

In question 9 the interviewees were asked, how many persons are employed by business intelligence full-time and part-time. The question turned out to be difficult because many of the respondents had difficulties to define what duties are classified under BI. Thus also the number of people working in BI related tasks was challenging to define. What is more, the respondent was not always aware of all the company's BI functions because of the huge size of the company. In the given answers the maximum value for the full-time workers was 2000 (second highest 150 and third 55) and for the part-time workers maximum value was 250 (second highest 75 and third 50). These maximum values differed notably from the other answers and thus they were ignored in the averages. Considering these restrictions, BI provided employment on an average full-time for 10 persons and part-time for 11 persons. In 2009 the averages were 6 in full-time and 15 in part-time.

In question 10 it was asked, if the companies had separate budget for business intelligence. Separate BI budget was defined in 37% of the companies. Companies that did not have a budget for BI (63%) had often decentralized the budget to other budgets. The smallest budget was 25 000 euros and the largest 12 million euros. The median of the budgets was 500 000 euros. The average for these budgets was around one million euros while the maximum value that differed notably from the other answers was

ignored. In 2009 slightly over half of the companies (53%) had a own budget for BI and it was on average from 0,5 to 1 million euros. At that time the largest budget was 2 million euros.

As illustrated in figure 5.4., the frequency of a separate BI budget is changing on different industries. On the field of real estate and construction no company has a separate budget for BI where as in the manufacturing industry 58% of the companies told that they have a separate BI budget.

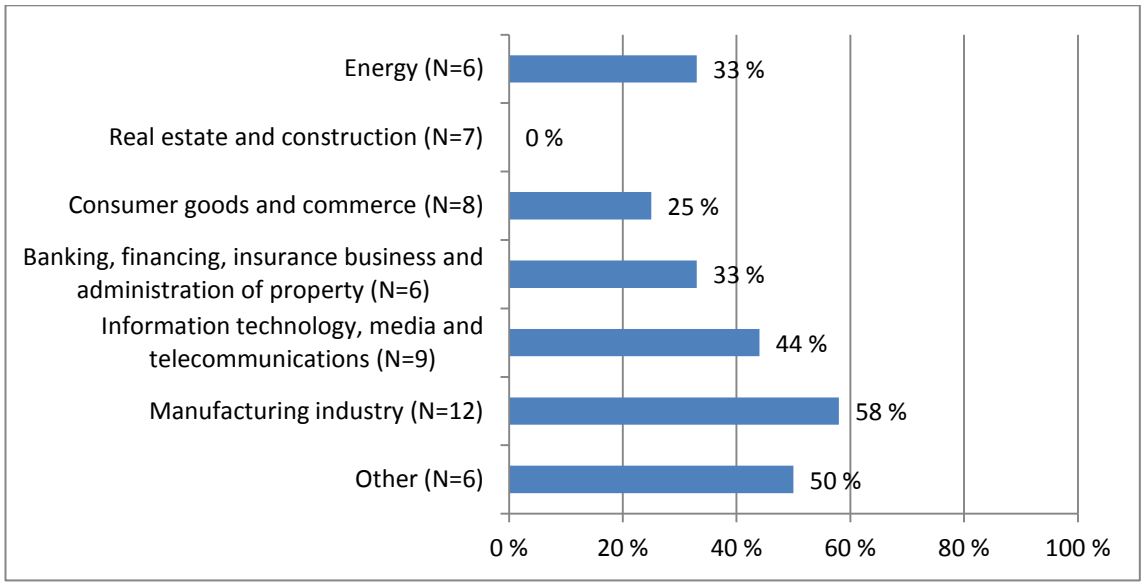

Figure 5.4. *Companies that have separate BI budget in different industries*

Different intelligence activities and their level of outsourcing were observed in question 11 (appendix 1). The answers are presented in figure 5.5. As the figure shows the listed activities are normally outsourced completely or partly except competitor surveillance, which is carried out internally in 53% of the companies. Only one company mentioned that they do not use competitor surveillance, otherwise all the listed intelligence activities were exploited by all the companies.

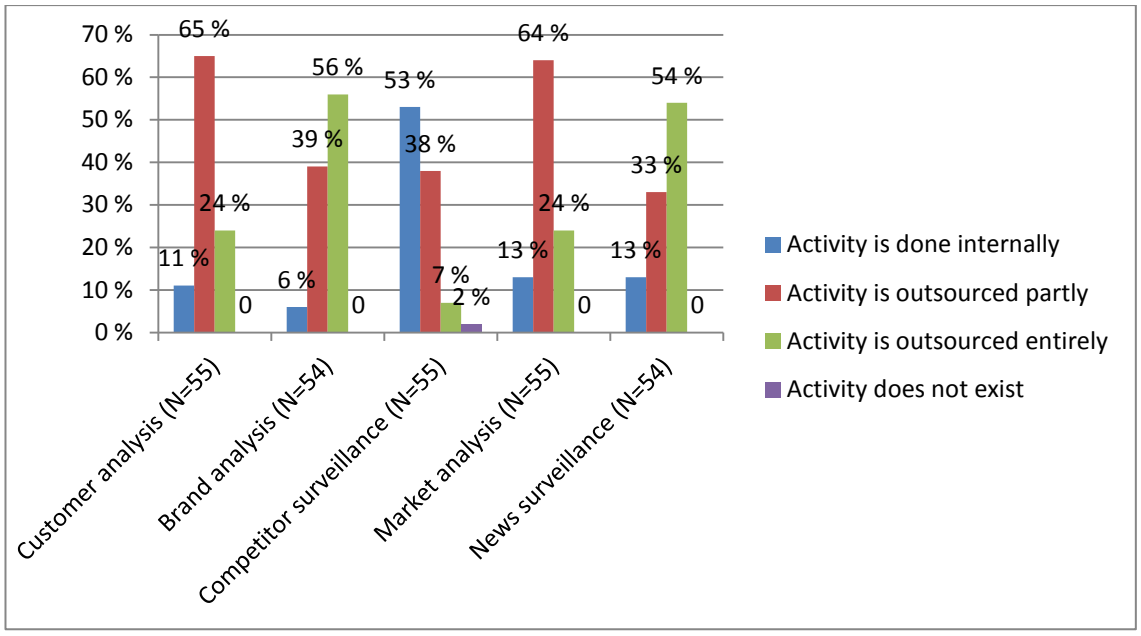

Figure 5.5. *The level of outsourcing for intelligence activities*

It was possible to add other intelligence activities to the given list of answers in question 11. For example internal finance information, customer base analytics, metrics, reports from the company's global side and surveillance of different industries were carried out internally. Partly outsourced activities were for example personnel satisfaction questionnaires and industry specific statistics. One respondent mentioned the Central Statistical Office's material as a completely outsourced activity.

In question 12 (appendix 1) the respondents were asked to judge, who are the main users of BI in the company. Different personnel groups were evaluated by the fact how important the information produced by BI is to them. The averages of the answers are illustrated in figure 5.6.

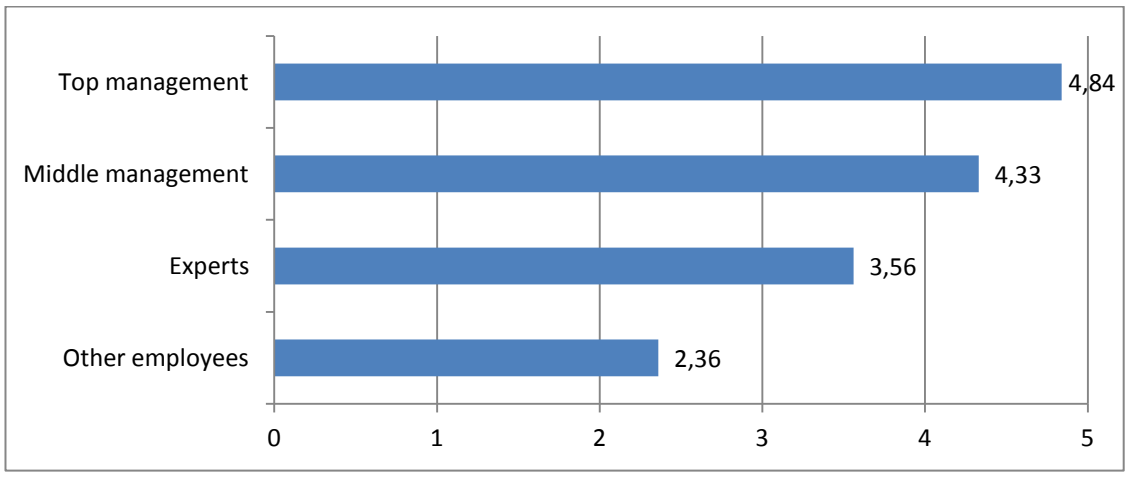

Figure 5.6. *The main users of BI in companies (1= not at all important, 5 = extremely important)*

According to the answers, BI related information is most important for the top management (4,84), other personnel groups in order of importance were middle management (4,33), experts (3,56) and other personnel (2,36). In 2009 the corresponding averages were 4,81 for top management, 4,25 for middle management, 3,75 for experts and 2,77 for other personnel. Top management and middle management have thus slightly reasserted their position of the most important users of BI related information.

Question 13 (appendix 1) surveyed, what functions of the company use information produced by business intelligence. These functions were evaluated by the amount of used information. The summary of the averages is illustrated in figure 5.7., according to which the three most important activities are strategic business planning and development (4,55), sales and marketing (4,15) and customership management (4,07).

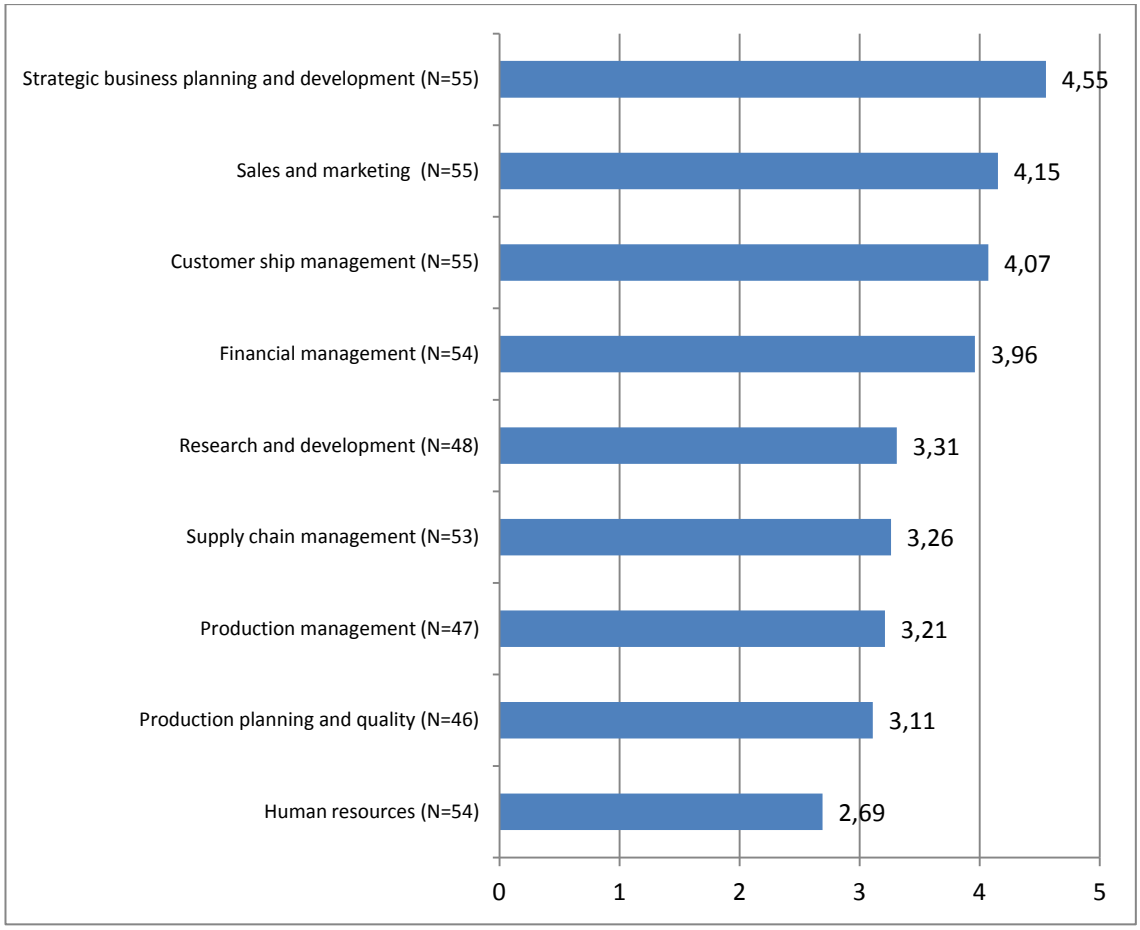

Figure 5.7. *Functions of the company that use information produced by business intelligence evaluated by the amount of used information (1=is not used at all, 5=is used extremely much)*

The list of activities in question 13 could be completed with own suggestions. One respondent gave value three for product controlling and in other responses the value four was given for communications, interest groups and lobbing and service

development. The highest value five was given for example for supplier and purchasing management, daily business management and assortment management.

Departing from the former studies in question 14 (appendix 1) the interviewees were also asked for which purposes information produced by business intelligence is used. The given processes were evaluated by the amount of used information. The responses of question 14 are illustrated in figure 5.8. The averages of the results reveal that information produced by business intelligence is used fairly evenly in the listed processes. Only in personnel management (3,09) the use of information produced by business intelligence was lower compared to the other processes.

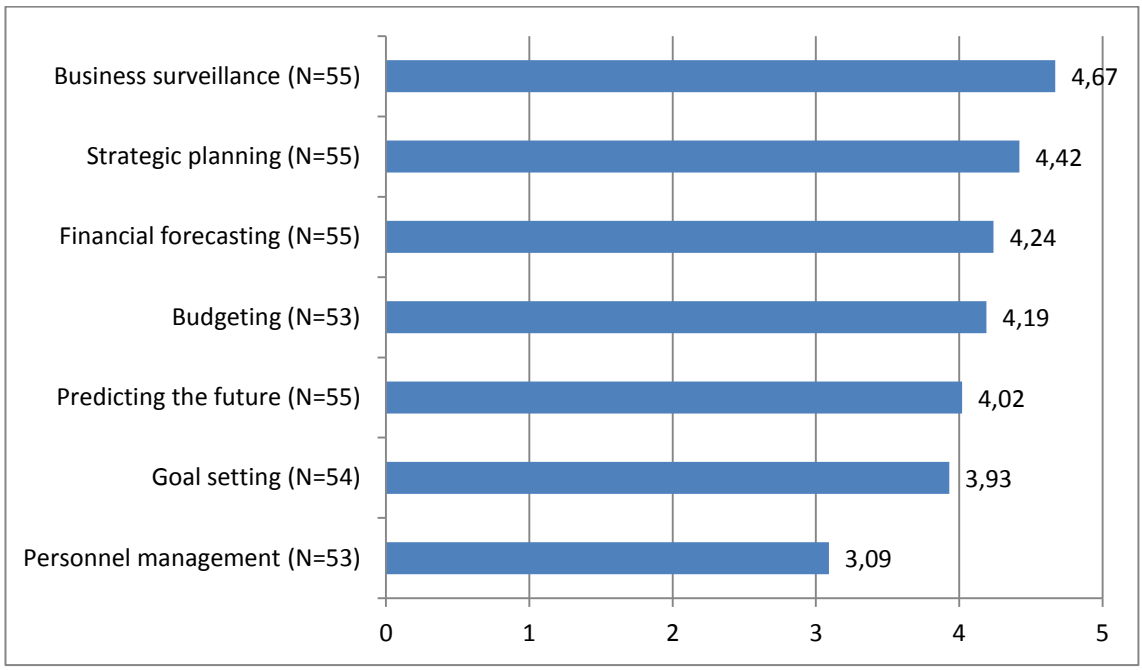

Figure 5.8. *Processes where information, produced by business intelligence, is used evaluated by the amount of used information (1=is not used at all, 5=is used extremely much)*

The given list in question 14 could be completed in the section "Something else". The value four was given for following answers: process performance, optimization of human resources, marketing and pricing. Product development, risk and compliance and risk management got the value five in individual responses.

In question 15 (appendix 1) the respondents were asked, how the company obtains employees' business intelligence. The open ended question's responses revealed that the most popular technique were questionnaires and personnel inquiries that were mentioned in 52% of the answers. The most popular individual tool, for example to carry out the questionnaires, was intranet (in 19% of the answers). In 15% of the answers personnel satisfaction questionnaires were mentioned separately. Also information dissemination portals, feedback pages and BI-tools were mentioned to

collect information from the personnel. Discussion forums were mentioned in 13% of the answers and they were realized for example in intranet. E-mail (10%) was mentioned as a tool to give feed back or to realize questionnaires.

Information was also obtained via social media. In individual responses for example company's internal tool that resembled the LinkedIn service, Facebook's private conversation groups and blogs were mentioned. In every tenth company there was also an online idea box or a similar service (10%) that was used to collect personnel's ideas and thoughts for example for the product development or to propose initiatives. Often it was seen that the information came from the information systems and data bases such as enterprise resource planning systems and customer relationship management systems (19%). One respondent commented that all the information that the personnel are producing during their work is collected into the systems from which it is used further to guide the business management.

Conversation based and face-to-face occurring information collection from the personnel was also used in the companies. Generally interviews were mentioned in 10% of the answers and one interviewee told that they interviewed the employees leaving the company. Some of the respondents informed that the information was obtained through meetings, gatherings and conversations (29%). Development discussions were mentioned separately in 13% of the answers. In some cases the information collection was seen to happen during different processes. For example the work in managerial groups and formulation of budgets and strategies were essential when obtaining the information from the personnel. In addition the information was gained when the personnel was involved in company's operations planning and different projects. Reporting processes were also seen important. Workshops were used in 8% of the companies and one of these respondents told that the work shop was carried out online in an Internet portal.

From the respondents 6% emphasized that the customers were the important information source. It was seen that there was no need to collect information from the personnel because the information was gained from the customer interface. The same amount (6%) informed that the information was not collected from the personnel and 15% mentioned that it was not systematic. For example the information collection was told to be based on irregular events or it was based on personal relationships and connections. Obtaining the tacit knowledge was seen difficult and it was stated that there is need for improvements to capture the information from personnel.

5.3. Business intelligence methods and tools

Different analyze methods, information systems and information products were discussed in the business intelligence methods and tools section. In question 16 (appendix 1) the respondents were asked to evaluate, what are the methods used by the

people responsible for BI in order to identify the critical information needs. The averages are presented in figure 5.9.

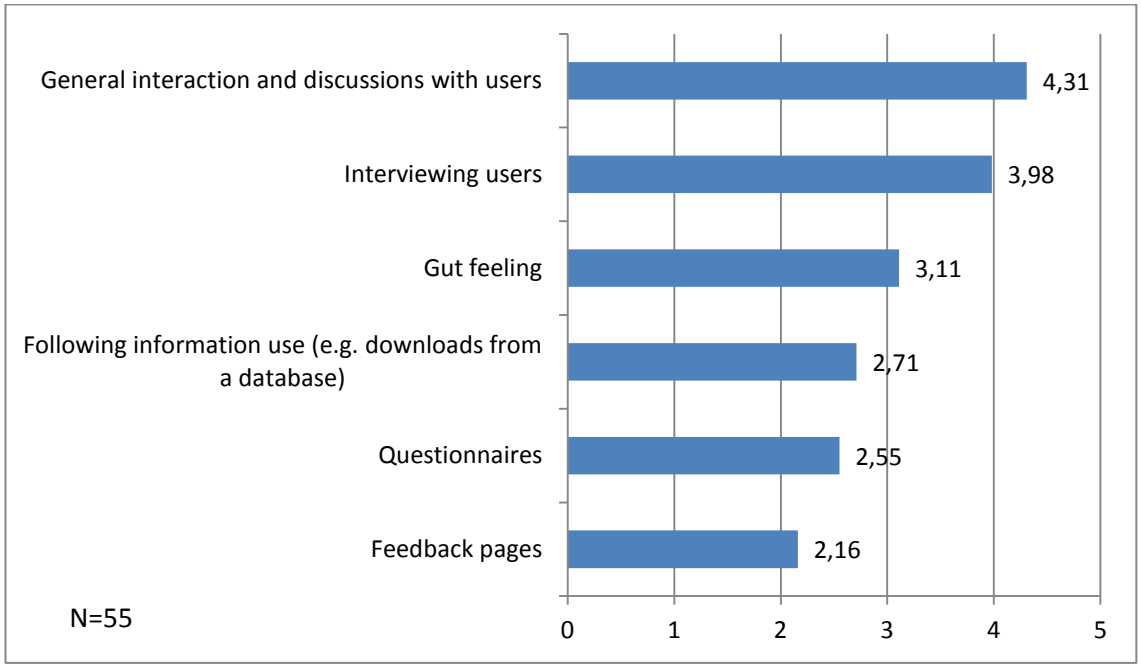

Figure 5.9. *Methods that are used by the people responsible for BI in order to identify the critical information needs (1 = not at all, 5 = extremely much)*

General interaction and discussion with users (4,31) were emphasized in the answers likewise interviewing users (3,98). It was possible to complement the list with own suggestions and one respondent gave a value three for special events where information needs are identified together. A value four was given to feed back e-mails, separate studies, strategy planning process and development projects. One respondent told that information needs were identified indirectly in managerial groups when the directors informed the persons responsible for BI. The value five was given to workshops, explorative data analysis, own personal business knowledge and view of what is essential.

In question 17 (appendix 1) was asked, how common the given information products are for the company's internal business intelligence. There were two information product types set against each other: ad hoc, case-specific inquiries and information products based on in advance specified information needs. In question 18 (appendix 1) the same matter was queried but from the external business intelligence point of view. The answers to questions 17 and 18 are gathered in figure 5.10. As the averages indicate the information products based on in advance specified information needs are used more both in internal (4,38) and external (3,82) business intelligence. When comparing the internal and external BI, both of the information product types were used more in internal business intelligence.

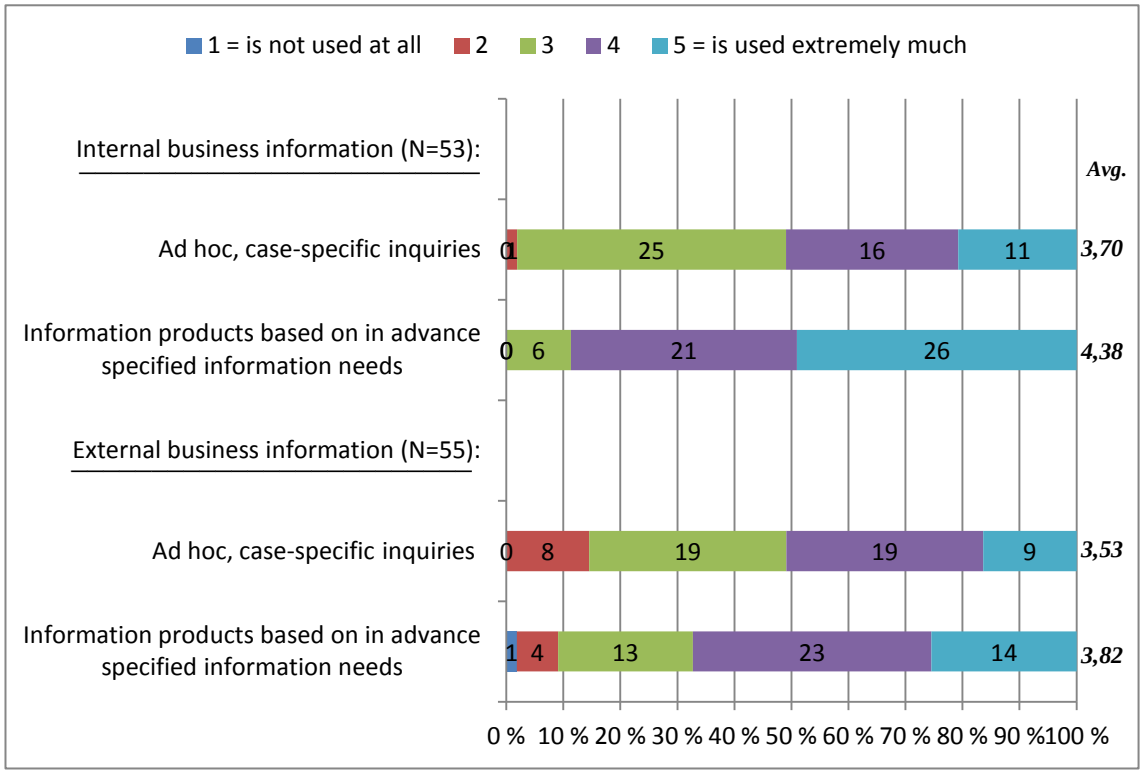

Figure 5.10. *The frequency of ad hoc, case-specific inquiries and information products based on in advance specified information needs (1=is not used at all, 5=is used extremely much)*

In question 19 (appendix 1) the respondents were asked to define, how many internal regular information products the company produces. The definition for an information product was given in the cover letter (appendix 2). As illustrated in figure 5.11, all the companies were producing at least one information product and most of the companies (65%) had over 10 regular information products. During the interviews it was revealed that "over 10" meant normally 10 to 70 information products. Some of the respondents told that their company produced hundreds of information products and one respondent estimated the amount to be over thousand.

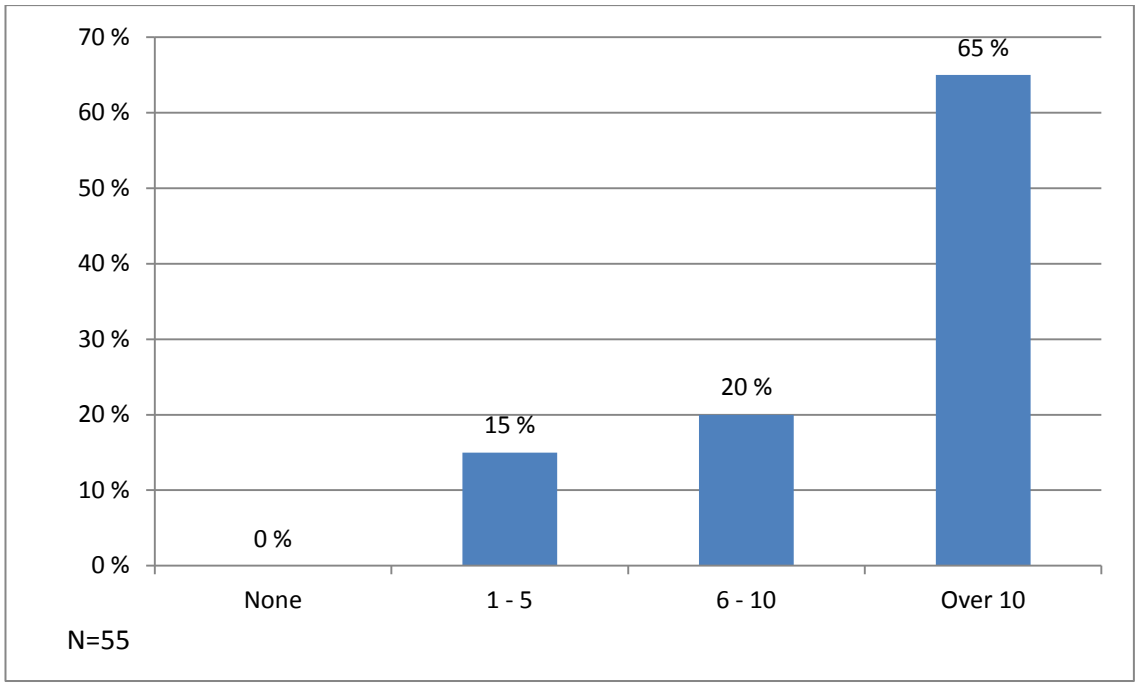

Figure 5.11. *Internal regular information products produced by the companies*

In question 20 (appendix 1) the respondents were asked to evaluate the importance of different analysis methods and tools for company's business intelligence analyses. In figure 5.12. the methods are presented in the order of their averages.

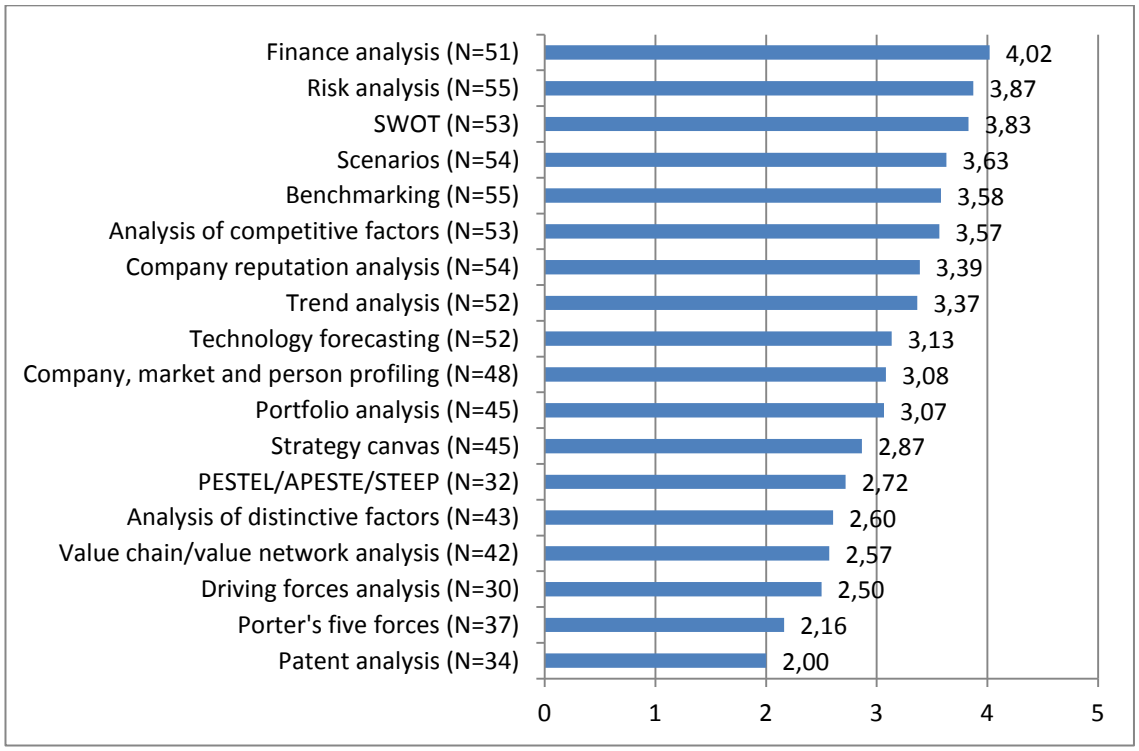

Figure 5.12. *The importance of different analysis methods and tools for company's business intelligence analyses (0= do not know, 1= not at all important, 5 = extremely important)*

When the average for the responses were calculated the response ”0=do not know” was not included. As seen in figure 5.12. this affects also to the amount of answers (N) which is now varying for the given analysis methods. In 2013 the top three was in the order of the importance financial analysis (4,02), risk analysis (3,87) and SWOT (3,83). In 2009 the top three was benchmarking (4,35), company, market and person profiling (4,16) and SWOT (4,10) (when option “something else”, which got the value 5 is not included). Finance analysis rose from the fourth position to first, risk analysis from seventh position to second and SWOT remained its place as third. It was possible to add methods and tools to the given list. Three methods that were not in the given list were pointed out in the option “Something else”. Value three was given for balance scorecard and value five for customer feedback analysis and personnel feedback analysis.

Question 21 (appendix 1) focused on information analysis by asking, how much the companies utilize the following methods regarding information obtained from internal information systems. The six methods listed in question 21 and their averages are illustrated in figure 5.13.

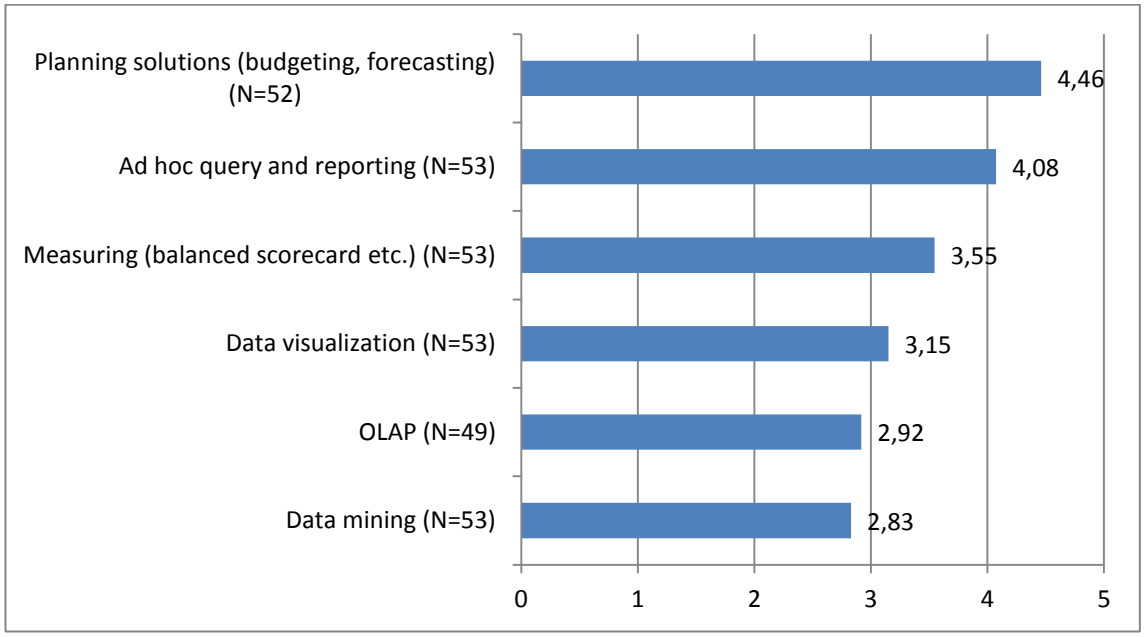

Figure 5.13. *How much the companies utilize the following methods regarding information obtained from internal information systems? (1 = not at all, 5 = extremely much)*

Planning solutions such as budgeting and forecasting likewise ad hoc query and reporting were the most used methods in 2013 and in 2009. The respondents were not always aware, if the methods were used in the company. This can be seen for example in the option OLAP (online analytical processing) as a lower answer rate compared to the response rate of the whole survey (see figure 5.13.). One respondent added that the company used value specifications to evaluate the development of the company’s value and this option was ranked as five.

In question 22 (appendix 1) the aim was to solve, how much the different functions of the company utilize BI's technological solutions for analyzing information obtained from internal information systems. Examples of the BI's technological solutions were given in the cover letter (appendix 2). Different functions by their average are presented in figure 5.14. Individual respondents added product management with the value of four and daily business management with the value of five to the list.

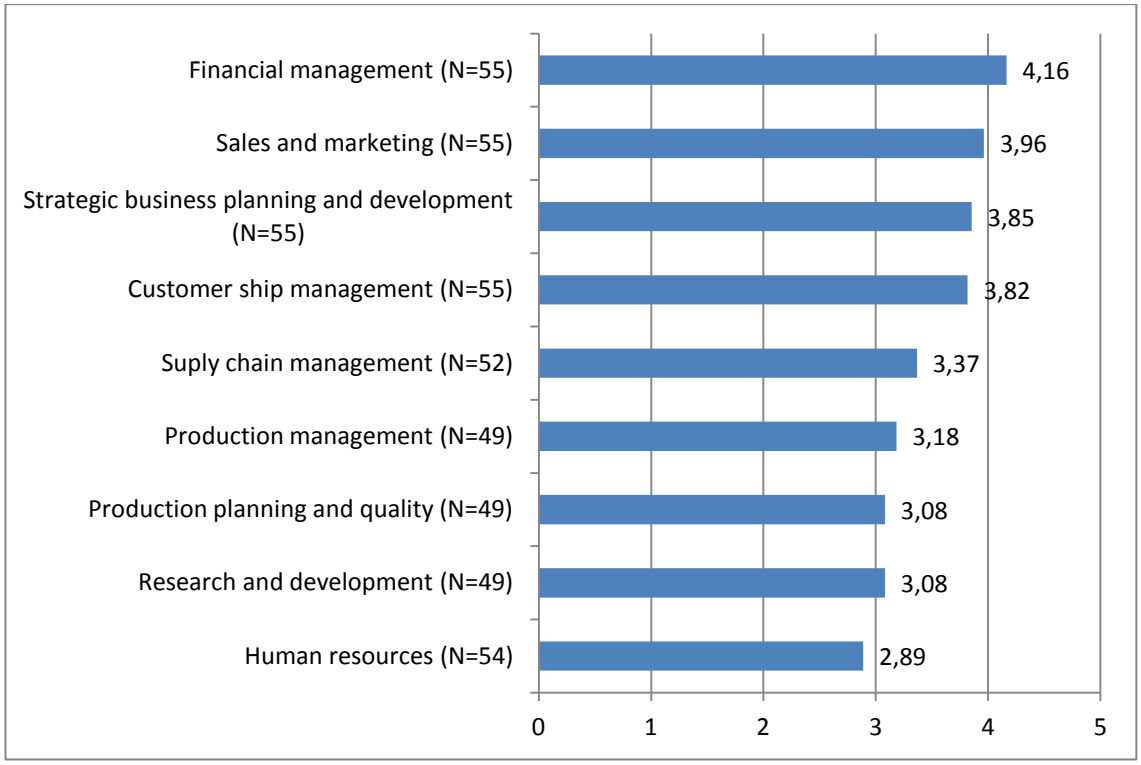

Figure 5.14. *Utilization of BI's technological solutions for analyzing the information obtained from internal information systems (1 = not at all, 5 = extremely much)*

BI's technological solutions were applied the most in financial management likewise in sales and marketing. In 2009 the top three consisted sales and marketing (3,97), business planning and development (3,70) and customership management (3,69). The most notable change compared to 2009 was the rise of financial management (2009: 3,60) from the position four to the first place with the average of 4,16. It has to be noted that the question was framed slightly differently in 2013 to improve the intelligibility of the question, but the meaning of the question did not change.

Different channels to deliver internal information products to users were evaluated by their importance in question 23 (appendix 1). As illustrated in figure 5.15., the most important channels were e-mail (3,84), personal presentation (3,67) and BI portal (3,58). Compared to the 2009 results the importance of the BI portal (4,23) has decreased. This might be explained with the fact that in 2009 the option was generally portal where as in

2013 it was specified in more detail as the BI portal. The importance of e-mail has increased slightly from the value of 3,78 (2009) to the value 3,84 (2013).

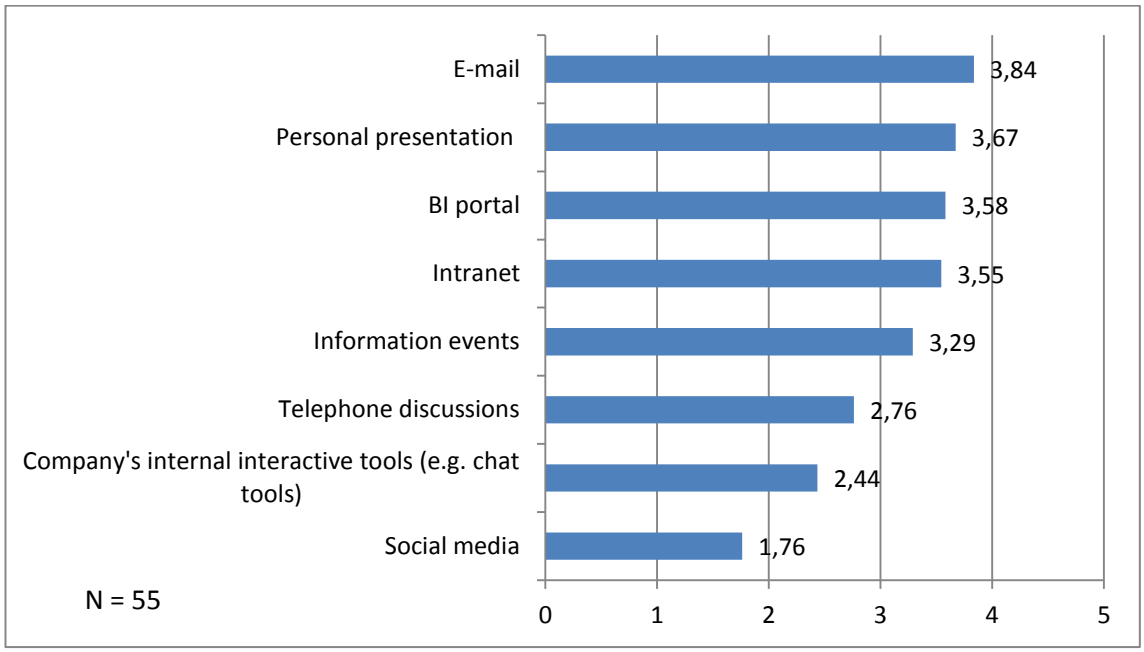

Figure 5.15. *The importance of different channels when delivering internal information products (1= not at all important, 5 = extremely important)*

Responses added to the given list were info-TV, blogs in intranet and modules of ERP system and they were given the value three. With the value four were evaluated the meetings of sales and marketing, internal information intensive systems and reporting. One respondent stated that a specific separate BI tool used by the company was extremely important.

5.4. Benefits of business intelligence

Benefits achieved with BI were evaluated in question 24 (appendix 1) through given statements. As shown in figure 5.16., the most important benefit achieved with BI was the improved quality of information. The second most significant benefit was more rational information gathering and analysis and on the third place was accumulated knowledge. In general the respondents saw that the given benefit statements were well accomplished because almost all of them got the average three or more. Only the options “recognized new business opportunities” and “improved quality of production and products” were left under the value three.

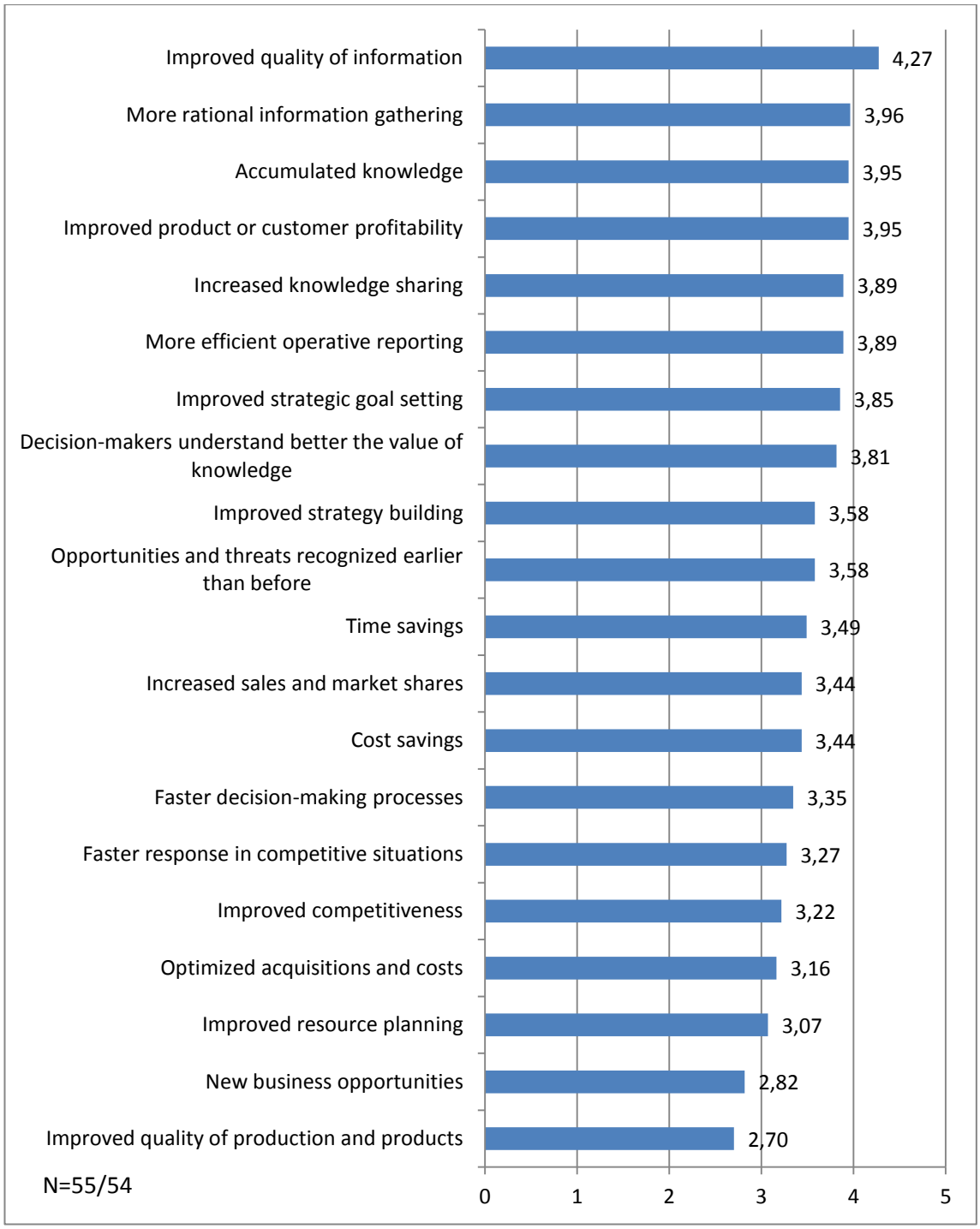

Figure 5.16. *Benefits achieved with BI (1=does not apply to our company, 5=applies well to our company)*

The list given in question 24 was completed with single answers. One respondent noted that the company's reputation and attractiveness as an investment had improved through BI and it was given the value four. It was also told that through BI the company has modeled better their business profitability and its affect on company's value. In addition the transparency and the commensurability of information were seen to be improved. These benefits were valued with the score five.

In question 25 (appendix 1) the respondents were asked to tell, if the benefits achieved with BI are measured. From the respondents 22% were measuring the benefits. This was a little bit more than in 2009 when the benefits were measured only by 16% of the companies. The question allowed justifying, how the measuring was carried out. Normally the measuring was realized through following the fulfillment of goals and results also competition and project specific metrics were observed. Also the added value through customer base and the improvement of utilization rate were seen as good benefit indicators. One concrete example to measure the benefits was to observe the amount of data that is sold to others or bought for the company. The ability to answer ad hoc –inquiries was also seen as one indicator for the gained benefits. Some of the respondents told that the measurement was actualized through questionnaires which the BI quarter was responsible for.

The benefits achieved with BI were not measured in 78% of the companies. In the comments most often was mentioned that BI is not defined as an own process and thus the measurement of it in its entirety is challenging. As was seen in some of the responses, BI was not organized systematically as one function but it was fragmented throughout the company. Thus the measurement of the benefits was seen problematic. Often the measurement of benefits was seen generally difficult and challenging. It is not easy to tell which process has lead to a certain decision or it is not easy to define how BI has changed the everyday activities. In one response it was argued that measuring is challenging because the means of measurement should be changed according to different situations and this was not seen worth of the trouble. Many of the respondents mentioned that there were not suitable metrics or there was lack of know-how on this area. In some companies measuring was under consideration and in some companies the BI was newly launched and thus the companies were not ready to measure it.

Some of the respondents emphasized that BI is a lifeline for the company and thus it is not necessary to measure it. As stated in one of the responses, BI was seen as self evident truth that helps to make decision at the right time. It turned out in some responses that measuring the benefits was not seen necessary nor useful enough. One respondent reminded that there are also so many other things affecting to the situation, which makes it difficult to identify only the benefits gained through BI. Another respondent noted that direct benefits are difficult to point out because some of the benefits are seen after a delay.

In question 26 (appendix 1) the respondents were asked if feedback from the users was collected about BI. The answers were asked to be commented on how the feedback is collected or alternatively, why the feedback is not collected. From the companies 71% collected feedback from the users. The most popular method mentioned were questionnaires that might have included questions only about BI or about multiple themes (for example internal customer satisfaction survey). Personal meetings, conversations and interviews were also popular ways to collect feedback. In one

company the inquiries were made to reference groups (for example five project managers were presenting the opinion of all the project managers). In some cases the feedback was asked in telephone conversations. Feedback was given also during projects and reforms and case specific reports were made in some companies. Some of the companies were using workshops and in one company separate events were held to collect the feedback. In single answers the feedback was told to come via portals, via e-mail or from feedback center. In one company the feedback was received even though it was not specifically collected.

Feedback from the users was not collected in 29% of the companies. The argumentation was similar to the answers in question 25. Because BI was not seen as a separate function, there was no separate feedback collection organized. In some companies the state of BI was still developing and thus collecting the feedback was seen challenging. It was also stated that the collecting was not systematic but the feedback was captured along with daily working or when problems occurred. Compared to the study conducted in 2009 the trend was downward, feedback was collected in 84% in 2009 and in 2013 the corresponding share was 71%.

BI usually aims to satisfy different information needs that were evaluated in question 27 (appendix 1). The most important information needs according to their averages were customer information, product and customer profitability information and information regarding own industry (see figure 5.17.). The listed information needs were seen important because, apart from information regarding parallel industries, all the averages of the options were over three. Other separately mentioned information needs were information concerning patents (valued as three), customer behavior (valued as four), information about different geographical areas (valued as four), information concerning personnel and their feedback (valued as four) and information concerning risks (valued as five).

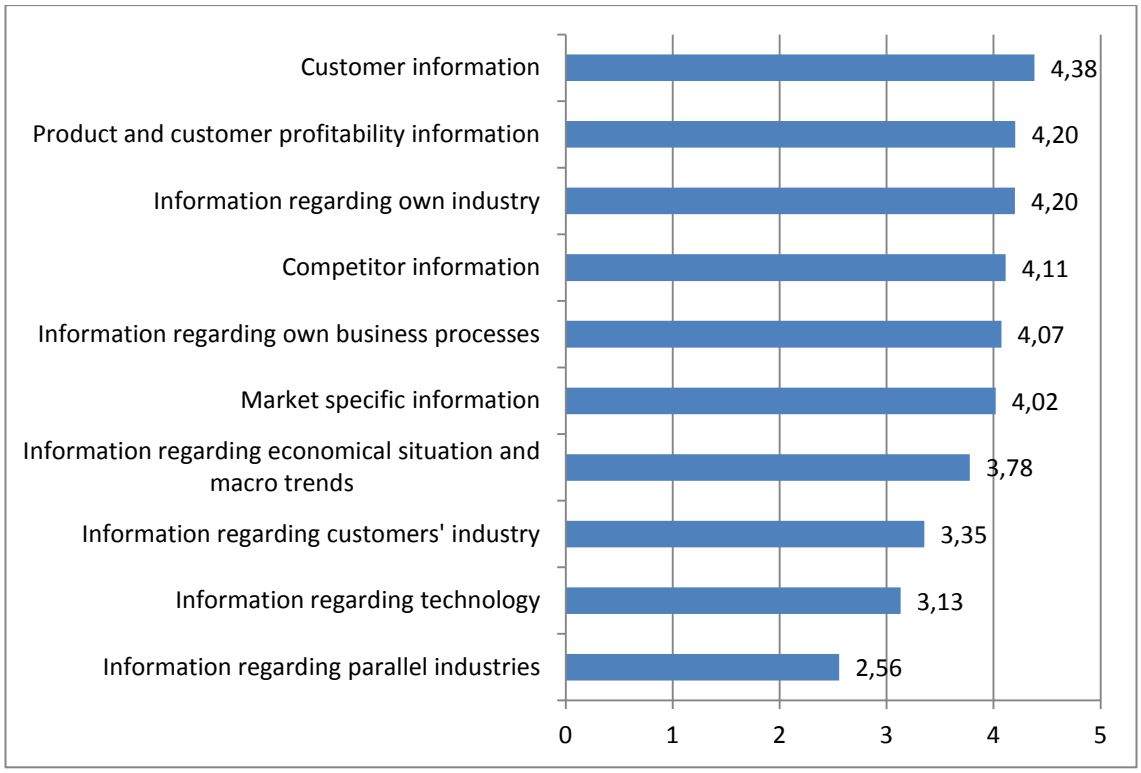

Figure 5.17. *The importance of different information needs (1= not at all important, 5 = extremely important)*

The most important information needs in different industries are presented in table 5.2. Normally there are two important information needs mentioned, but if the averages were even there might be more options listed. As the table reveals, on the fields of energy and real estate and construction the importance of competitor information and information regarding own industry are emphasized. Whereas, on the other industries, the customer information seems to be most essential information need.

Table 5.2. *The most important information needs on different industries*

Industry	**The most important information needs and their averages**
Energy (N=6)	Competitor information (4,5) Information regarding own industry (4,5)
Real estate and construction (N=7)	Information regarding own industry (4,71) Competitor information (4,43)
Consumer goods and commerce (N=8)	Information regarding own industry (4,63) Customer information (4,38) Information regarding own business processes (4,38)
Banking, financing, insurance business and administration of property (N=6)	Customer information (4,57) Product and customer profitability information (4,43)
Information technology, media and telecommunications (N=9)	Information regarding own business processes (4,78) Customer information (4,67)
Manufacturing industry (N=12)	Customer information (4,33) Market specific information (4,17) Information regarding economical situation and macro trends (4,17)
Other (N=6)	Customer information (4,33) Product and customer profitability information (4,33)

In question 28 (appendix 1) the respondents were asked how they assess their company's success in different areas of BI and about BI as an entirety. The responses are illustrated in figure 5.18., which shows that the companies experience their strengths to be in internal BI. The least successful area of BI was assessed to be obtaining employee's business intelligence.

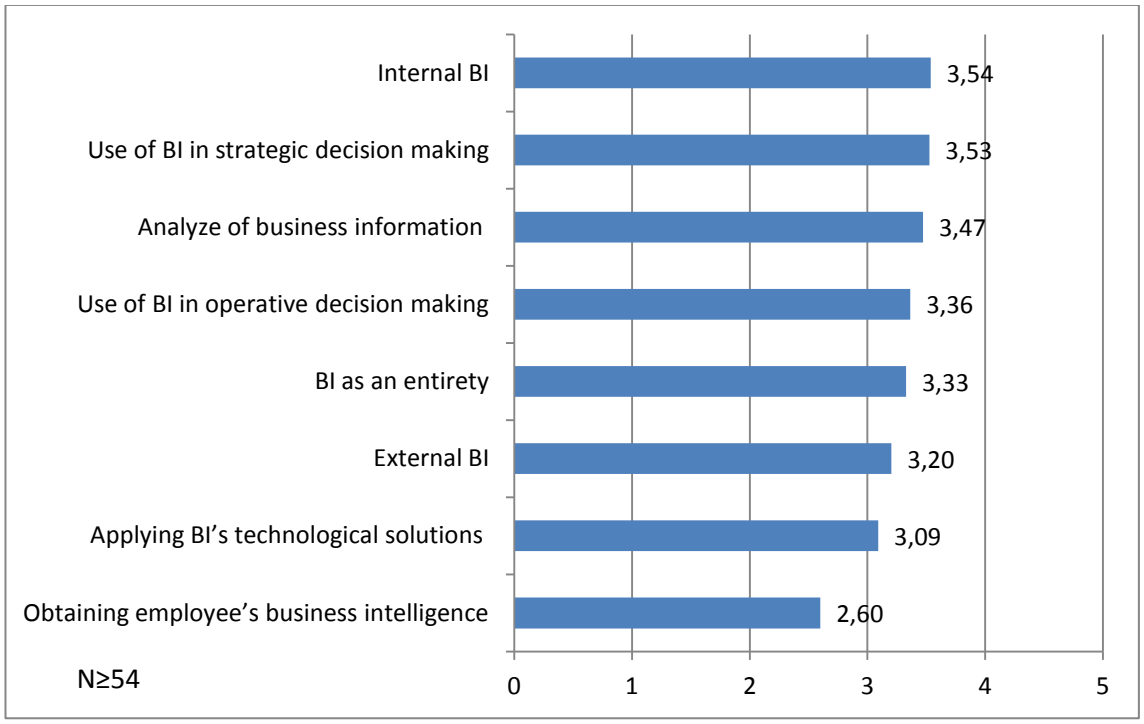

Figure 5.18. *Success in different areas of BI (1=poor, 5=excellent)*

The success in BI as an entirety was evaluated with the value three in most of the companies (49%). Only one company estimated it to be poor (value one) and one company estimated it to be on excellent level (value five). Internal business intelligence and analyze of business information were areas in which six companies estimated to be on excellent level. On the other opposite, obtaining employee's business intelligence was seen to be poor in seven companies. These were the biggest respondent groups on the in the extremes of the scale. As shown in figure 5.18., the success in different areas was quite even with the averages raging from 2,60 to 3,54.

In question 28 the industry specific variation was considerable in the area of BI's technological solutions (see table 5.3.). The companies operating on the field of information technology, media and telecommunications saw their competencies to be high on this area where as on the field of real estate and construction the respondents rated their success much lower.

Table 5.3. *Success in applying BI's technological solutions on different industries (1=poor, 5=excellent)*

Industry	**Average**
Energy (N=6)	2,83
Real estate and construction (N=7)	2,14
Consumer goods and commerce (N=8)	3,38
Banking, financing, insurance business and administration of property (N=7)	2,86
Information technology, media and telecommunications (N=9)	4,00
Manufacturing industry (N=12)	3,00
Other (N=6)	3,17

The averages were more regular when observing the BI as an entirety. Again companies operating on the field of information technology, media and telecommunications experienced that they were successful in BI as an entirety and the companies operating on the field of real estate and construction saw their competencies to be the lowest. The industry specific averages are presented in table 5.4.

Table 5.4. *Success in BI as an entirety on different industry groups (1=poor, 5=excellent)*

Industry	**Average**
Energy (N=6)	3,17
Real estate and construction (N=7)	2,86
Consumer goods and commerce (N=8)	3,38
Banking, financing, insurance business and administration of property (N=7)	3,14
Information technology, media and telecommunications (N=9)	3,56
Manufacturing industry (N=12)	3,50
Other (N=6)	3,50

Question 29 (appendix 1) gave the opportunity to argument the choices made in question 28. From the respondents 61% indicated that they were in a development stage with BI or that there were some points of improvement identified in BI. For example one respondent told that problem points were identified and measures are being taken to fix them. Another respondent mentioned that they had strong will to improve the BI on all the areas listed in the question. In some of the answers the meaning of analysis was emphasized and it was also stated that more time should be arranged for it. Collecting information from the employees was seen problematic because it was not systematic or supported by the organization culture. One respondent told that strategic decision making should be improved especially regarding the weak signals. In several answers the fragmented nature of the activity was seen as the main problem. According to one respondent BI was not managed from one point and the information was in silos around the organization. In some cases it was seen that the given recourses were not enough to improve BI to the level where it should be. In one response it was noted that BI is not one of the focus points and thus the company is not succeeding in it.

Two respondents emphasized that BI had been applied for many years and because of this the companies were well developed on this area. One respondent told that BI had been one essential factor in company's good success and this was the reason to rate high different areas of BI in question 29. In single responses some specific areas were discussed. For example one respondent experienced that applying BI's technological solutions was well organized because all the information systems were integrated in a way that allowed getting the information "from one hatch". It was also mentioned that the given high values were based on well functioning basic processes and the support of the top management. A success in different areas of BI was also linked on the fact that decisions were made based on information and knowledge.

In the open ended question 30 (appendix 1) the respondents were asked to which questions the companies would like to have answers with the help of BI. It can be seen that the responses have a confluence with question 27 because the themes were quite the same as the information needs listed in figure 5.17. Answers were sought especially to themes such as forecasting, markets, profitability, customerships, products and services. Identifying trends and interpreting weak signals were emphasized in forecasting. The respondents wanted to understand better the evolving markets and how to position themselves in this market field. Data about profitability, costs and sales likewise information liked to metrics were factors that companies wanted answers with the help of BI. Things related to competitor and competitiveness such as benchmarking and competitor analysis were also mentioned in the answers. Customership management, producing added value to the customers and understanding customer's challenges were also popular themes likewise product and service portfolio management. Some of the answers discussed personnel, partners and outsourcing. Also merging information from different sources, faster analysis and information filtering were themes that companies would like to have answers with the help of BI.

5.5. Future

In the future section the aim was to survey the forthcoming plans of the companies and to get a better picture what can be expected on the field of BI. In question 31 (appendix 1) the respondents were asked to evaluate, how the investments in BI are going to change during the next five years. The percentage responses are presented in figure 5.19.

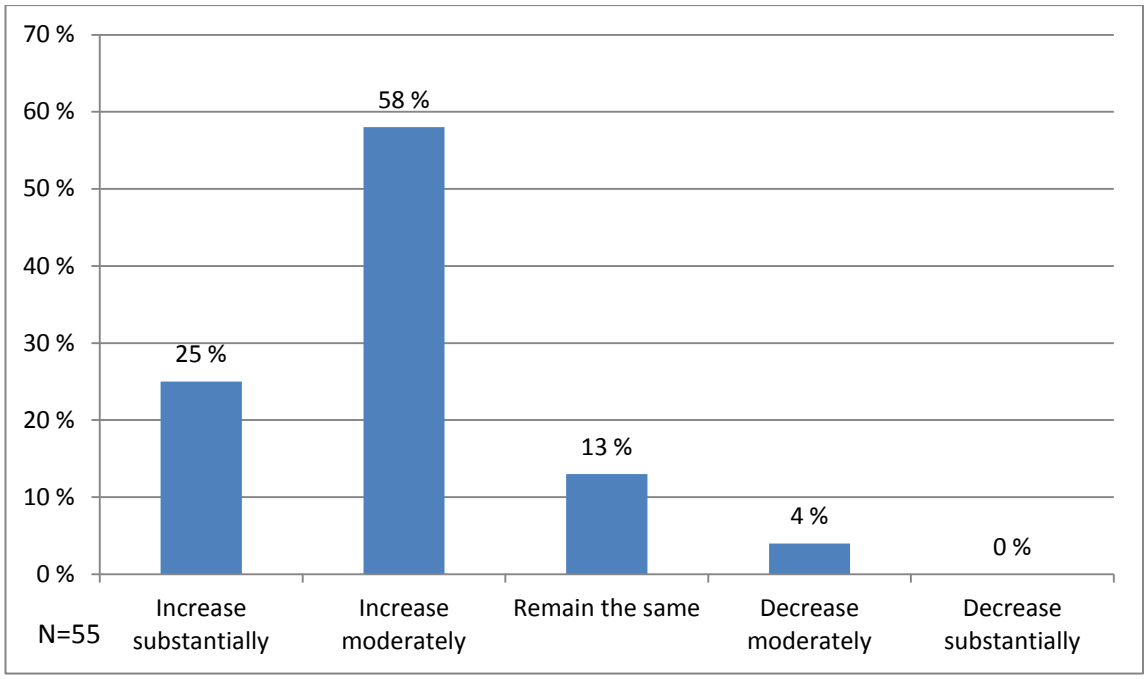

Figure 5.19. *Companies' investments in BI during the next five years*

As seen in figure 5.19. the companies that are increasing their investments substantially and moderately form together the majority (83%) of the responses. In 2009 the investments were believed to be increased substantially by 9%, increase moderately 50%, remain the same 34%, decrease moderately 6% and decrease substantially 0%. Comparing the situation between 2009 and 2013 it can be seen that the percentage shares in options "increasing substantially" and "increasing moderately" have risen several percentage points.

If the investments for the next five years are observed on different industries it can be seen that the ones decreasing the investments come from the field of consumer goods and commerce and from the manufacturing industry (see figure 5.20.). Substantially the investments are going to increase especially on the field of real estate and construction.

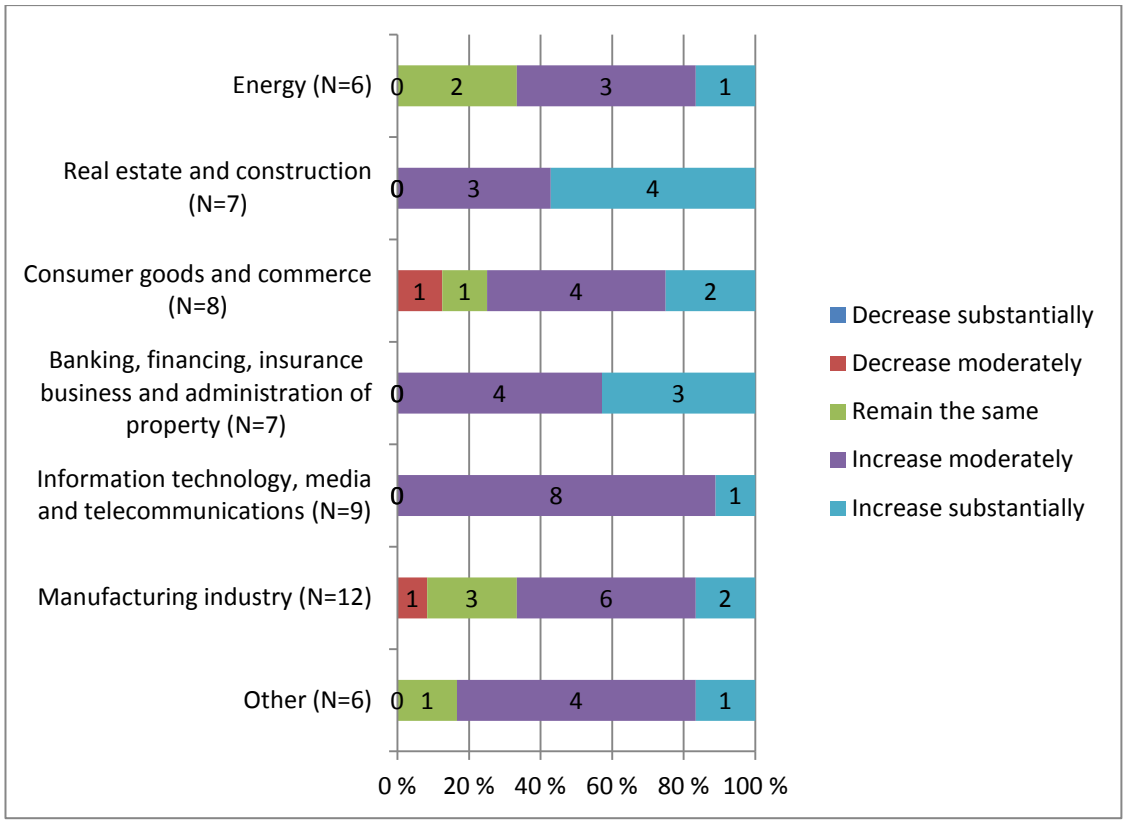

Figure 5.20. *Investments in BI on different industries in next five years*

It was possible to explain the answers of question 31 in the next question 32 (appendix 1). The ones increasing investments substantially (25%) mentioned that in the future information is essential competition factor and BI is important area of focus. Different projects and development plans, such as renewing a solution platform and data base solution, were reasons to increase the investments. Also analysis needs were seen to be growing and this was craving more recourses. Some companies mentioned that companies' expansions, fusions and other structural changes were increasing the investments substantially.

The companies increasing their investments moderately (58%) mentioned same kind of arguments that the companies' increasing their investment substantially. In addition the surveillance of the surrounding environment and the general situation around the world (e.g. financial crises) were factors that might increase the need for extra investments. The technology development and for example the growing utilization of mobile devices were also seen as factors increasing the investments. It was also told that the existing resources were intended to use more effectively by allocating them right and by functioning in more coordinated way. One respondent mentioned that the investments were increasing only moderately and not substantially because BI did not yet have the commitment of the top management.

The companies that kept the investments at the same level (13%) mentioned often that there had already been made a significant amount of investments and thus the investments were not going to grow anymore. There was a will to concentrate in making the investments to pay back. In some cases BI was seen to be on a good level and it did not need extra investments. In one response it was mentioned that the investments remain relatively the same because new projects start when the former projects end.

The ones that were decreasing their investment moderately (4%) reasoned their choice with cost savings and with rationalizing the activity. It was also told that there had been substantial investments already made during the last years and compared to these amounts the investments were decreasing. No company mentioned the investments to decrease substantially.

In question 33 (appendix 1) the previous two questions could be specified by indicating in which BI area the investments were going to be the same as before, more than before or less than before. The areas where companies are going to have the same amount of investments are for example competitor-, customer- and industry surveillance likewise reporting (especially finance- and management reporting). Analysis of own internal business information and purchases of external researches were also mentioned in the answers. Often it was emphasized that the current activities are going to stay the same or that the areas of BI will be developed more.

Most of the answers in question 33 were given in the option ”more than before” which was commented by 48 respondents. From these interviewees 29% mentioned that the future investments are made concerning the customer functions. For example optimization of the customer base, customers’ behavior in digital world and customership management were seen important investment targets. Information systems, data bases and different technologies were mentioned altogether in 27% of the answers. The given examples included the development of the ERP-system, implementation of mobile devices, renewing the data base and utilization of cloud services. Reporting (17%) and analysis (17%) were also mentioned. Analysis might have concerned external business information analysis, strategic analysis or need for new analysis tools. Some mentions were made about analytics and forecasting likewise about the competitors and markets. Some of the companies were going to invest more in big data, social media and external business information in general.

The answers to question 31 (see figure 5.19) indicated that the investments in BI are more likely to increase than decrease. This observation was confirmed by the low response rate in the option “less than before”, because often there were no areas of BI where companies were investing less than before. In the responses it was emphasized that no area will be decreased and that the aim is to obtain at least the current level in BI. Some respondents told that there had already been investments in information

systems and thus these investments were decreasing. In some cases it was hoped that the manual reports and separate ad hoc –analysis and inquiries would decrease.

In question 34 (appendix 1) the respondents were asked to choose the methods that the company was planning to utilize or substantially increase utilizing within the next year. The amounts of chosen options are presented by their percentage shares in figure 5.21. The most popular methods were measuring (e.g. balanced scorecard) and data visualization that both collected 32% share of the responses.

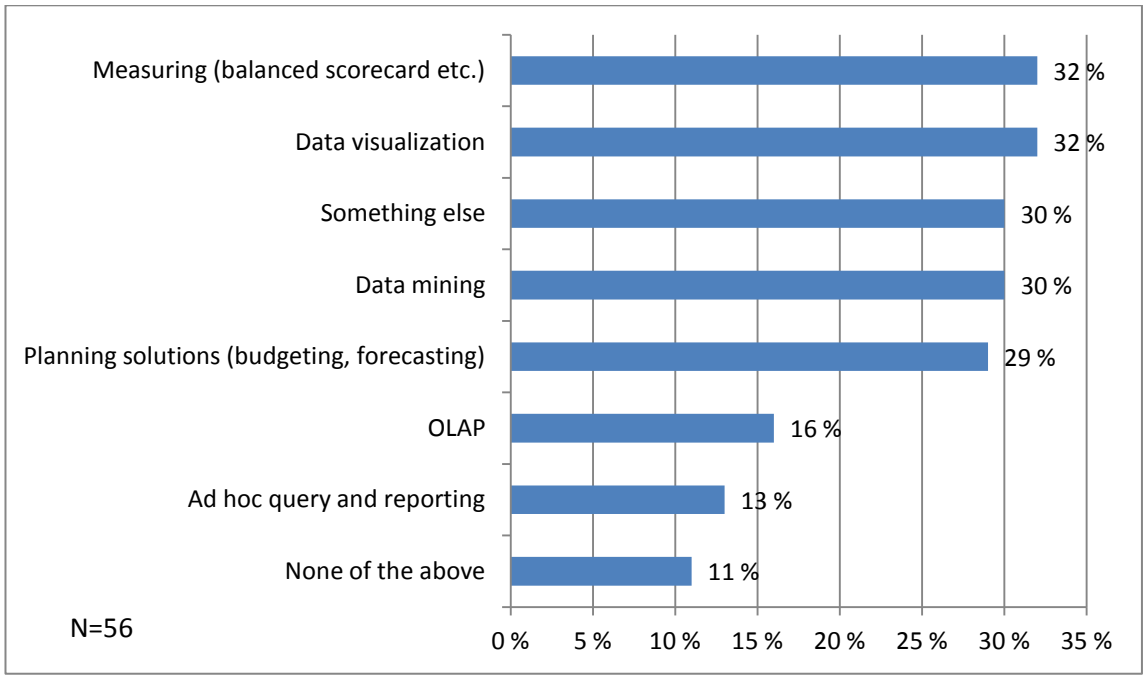

Figure 5.21. *Methods that companies are planning to utilize or substantially increase utilizing within the next year*

The given list could be complemented with own suggestions. Four of these "something else" –responses involved solutions for information dissemination and management. For example, there had been planned an implementation for new BI portal. Mobilization was mentioned in three answers and in single responses analysis, renewing of technology, proactive surveillance of environment and integration of information sources were observed.

In 2009 25% of the respondents announced that they were not planning to utilize or substantially increase utilizing the listed methods within one year. The economical situation of that time with the tight budgets was mentioned to affect these choices. In 2009 that option had been the most popular with the 25% share where as in 2013 it was the least popular choice with 11% share. In the former study the percentage shares were ranging from 8 to 17. For example planning solutions was second popular choice after the "None of these" –option. In 2013 all the listed options had increased their percentage shares compared to the situation in 2009.

In question 35 (appendix 1) the respondents were asked in which functions they are planning to start utilizing or substantially increase the utilization of BI's technological solutions within the next year. It was possible to choose several options from the given list and the accumulated answers are shown in figure 5.22.

Figure 5.22. *Functions, where companies are planning to start utilizing or substantially increase the utilization of BI's technological solutions within the next year*

The questionnaire form did not allow adding own options to this question. Nevertheless during the interviews in one answer the options were complemented. The BI's technological solutions were planned to be used in daily business management and for the purposes of management group of business (for example the use of mobile devices). On respondent noted that the investments are not going to be seen substantially in any specific function but moderately in all of them.

Over half of the respondents (53%) are going to utilize BI's technological solutions in sales and marketing. In 2009 sales and marketing was second popular with 38% share. The first in 2009 was customership management with 50% share whereas in 2013 it was on second place but the percentual meaningfulness had not decreased significantly (see figure 5.22.). However there could be noted increase in other functions. Compared to the results in 2009 human recourses rose 9 percentage points, research and development 13 percentage points, financial management 18 percentage points and strategic business planning and development[6] 19 percentage points.

[6] *In 2009 the term was only "business planning and development".*

The respondents were asked to evaluate possible areas of improvement in question 36 (appendix 1). The results are illustrated in figure 5.23. in the order of options' averages. The list was not complemented with other options even though this was possible.

Figure 5.23. *Areas of improvement in BI (1= not at all important, 5 = extremely important)*

As shown in figure 5.23 the most important area of improvement was seen to be better use of current BI's information systems. Also in 2009 this was seen the most important area of improvement with the average of 4,13. In 2013 the second important area of improvement was making more profound analyses with the average of 3,79 (3,93 in 2009) and third important was identifying critical information needs with the average of 3,57 (4,00 in 2009). The most important areas of improvement observed on different

industries (see table 5.5.) were somewhat imitating the generally noticed improvement targets. Although on the field of information technology, media and telecommunications the focus of the improvements was more on employees.

Table 5.5. *The most important areas of improvement in BI on different industries (1= not at all important, 5 = extremely important)*

Industry	**The most important areas of improvement and averages**
Energy (N=6)	Identifying critical information needs (4,17) Making more profound analyses (4,17)
Real estate and construction (N=7)	Developing information systems and tools (4,43) More effective knowledge sharing (4,43)
Consumer goods and commerce (N=8)	Better use of current BI's information systems (4,38) More effective knowledge sharing (4,00)
Banking, financing, insurance business and administration of property (N=7)	Better use of current BI's information systems (4,57) Making more profound analyses (4,43)
Information technology, media and telecommunications (N=9)	Better use of current BI's information systems (3,89) Increasing employees' attention of business intelligence (3,56) Employees' competences (3,56)
Manufacturing industry (N=12/13)	Better use of current BI's information systems (3,75) Prioritizing and satisfying information needs (3,54)
Other (N=6)	Making more profound analyses (4,17) Better use of current BI's information systems (3,83)

When the averages presented in figure 5.23 are compared to the corresponding averages from 2009 only the importance of being on schedule has risen slightly (average of 2,64 in 2013 and average of 2,45 in 2009) whereas all the other areas of improvement have somewhat lost their importance. The highest variation is seen in measuring the benefits (average of 2,68 in 2013 and average of 3,38 in 2009) and utilization of company's internal information (average of 3,38 in 2013 and average of 4,03 in 2009).

Question 37 (appendix 1) discussed about different trends which's development of significance was valued in company's BI within the next three years. It was possible to complete the list with own suggestions. The valued trends in their order of significance are presented in figure 5.24. where the division of the given values is also illustrated.

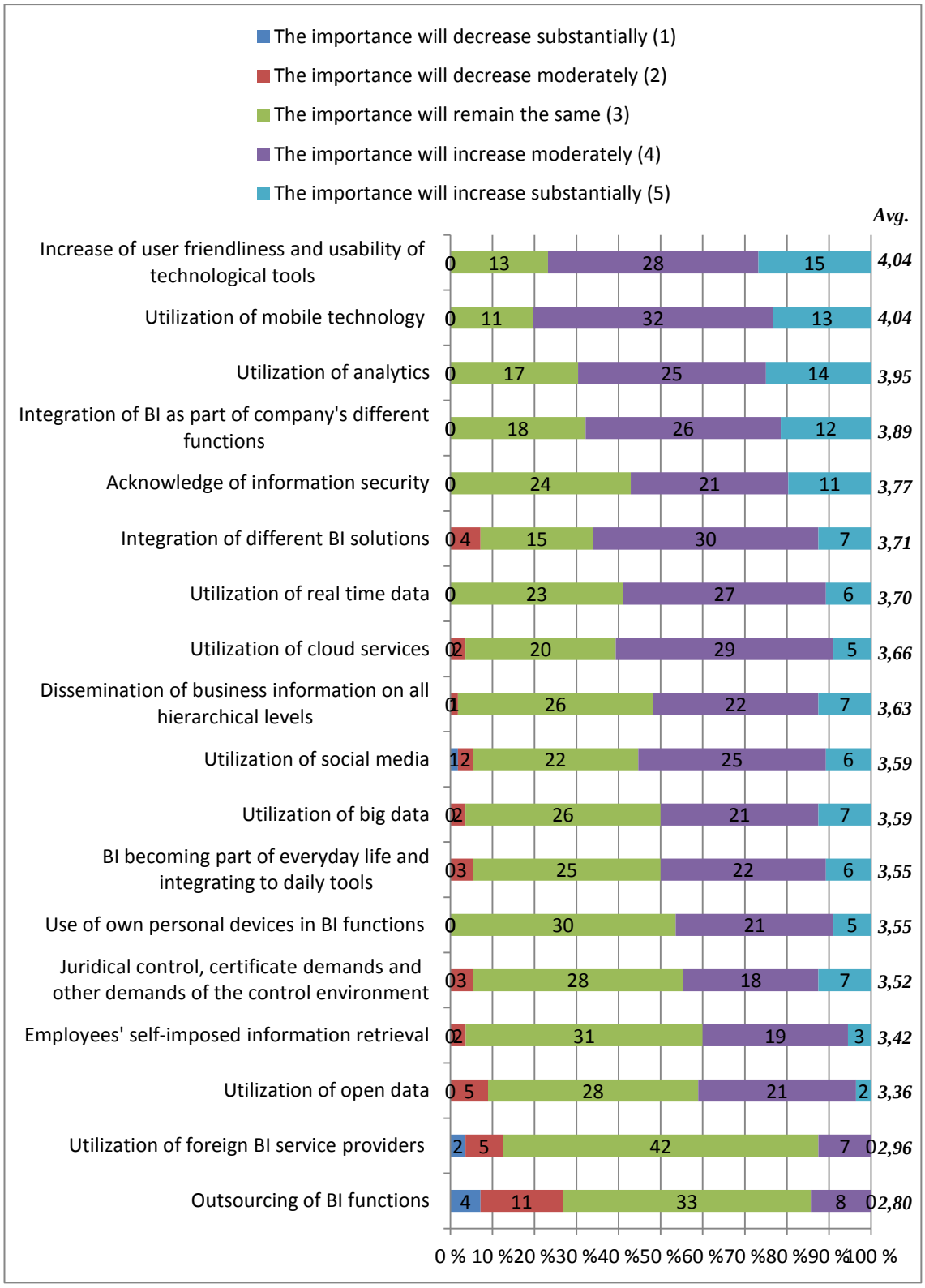

Figure 5.24. *The different trends' development of significance in company's BI within the next three years*

On the value scale the option three was a neutral point where the trend's significance did not change. For example utilizing foreign BI service providers (2,96) had 42 answers on the value three. In these answers it was pointed out that foreign BI service

providers were not used at the moment and there is no intension to do so within the next three years and this was the reason to choose value three. Utilizing mobile technology (4,04) and the increase of user friendliness and usability of technological tools (4.04) were the most popular trends by their averages. On the other hand if the distribution of the given values are observed, no respondent believed that the significance of utilization of real time data (3,70) and the use of own personal devices in BI functions (3,55) was going to decrease during the next three years. From the presented trends the outsourcing of BI functions (2,80) was decreasing the most.

There were single responses that complimented the given list of trends. Value two was given for resistance of digitalization. The respondent gave an example that some documents are still wanted via e-mail even though the same file could be found from the new intranet. Value two was given also to use of Excel tables. In one answer trend that is moderately increasing it significance was stabilizing the new BI tools. Legislation considering corruption, information collection from companies with the use of systems and processes and the blurring of industrial groups' boundaries were mentioned as trends that were increasing their significance extremely. The value five was given also to optimization, visualization of information and environmental controlling.

In the last question 38 (appendix 1) the respondent were asked to reflect, what kind of changes and developments the BI will face in the next five years. The question could be answered from the company's point of view or it was possible to take a more generalized perspective. The previous question 37 might have slightly directed the responses because some of the listed trends were used as a base on the ideas of the respondents. The answers could be divided into eight different themes that were

- The increasing amount of data and fast changes (34%)
- Mobilization and the concept of real time (28%)
- The increasing importance of information analysis and utilization of analytics (26%)
- Development of technology, information systems and tools (24%)
- Integration of different information sources (20%)
- BI becoming part of everyday life and integrating to other activities (18%)
- Network based working and interactivity (14%)
- The increasing importance and appreciation of BI (12%)

The frequency of the above mentioned themes presented in percentages in parenthesis are in proportion to the 50 answers that were given in question 38. One answer might have included several themes and point of view might have varied (e.g. own activities or activities in general). These themes and also some other ideas are presented in the following.

The most popular theme of the answers was *the increasing amount of data and fast changes (34%)* that was also linked to the need to simplify and prioritize the data. It was stated that the information was getting old faster and the time for anticipation shorter, and thus during long projects things might have already aged. According to one respondent this kind of development demands more comprehension because otherwise people will drown into the data. The importance of data mining tools was supposed to grow because there is need to separate the essential information from the useless noise. Big data, which was mentioned in six answers, is also linked to the growing amount of data. It was forecasted that it is important to learn to take an advantage of big data and that big data will have an essential role in the future. One respondent believed that within the next five years first tools to manage big data are developed and it is possible to start analyzing the unstructured data.

Mobilization and the concept of real time (28%) were often presented in the same answers. With mobilization the respondents meant that the information could be accessed where ever and when ever, and often in real time. It was also forecasted that the access to information is going to improve and that information will be always present. It was stated that this kind of development is supported by the mobile technology and the independency from device platforms and environments. Also cloud services were mentioned as a way to enable easy information dissemination. One respondent estimated that the use of information is going to be more simplified for the end users within five years.

Because of the constant growth of data and its unstructured essence, *the importance of information analysis and utilization of analytics is increasing (26%)*. It was mentioned that the capacity of analysis is growing and this way it is possible to find more patterns and dependencies from the data. In one response the analysis tools were believed to develop so far that the absolute amount of information is losing its meaning. In the future it is also possible to do deeper and more prioritized analysis. In addition it was forecasted that the tools allow making analyses independently and for example with the help of dashboard solutions the windows can be remodeled according to the user's needs.

Development of technology, information systems and tools (24%) was experienced as one important theme that was linked to the other themes presented above. The respondents might have mentioned in general that information systems and tools are advancing or told more specifically that in the future the tools enable better visualizing. It was also estimated that the tools will serve better the needs of group working and that their user friendliness and usability will be improved. The respondents believed also that the cloud services are getting more common, the processing capacity is growing and that the integration between different systems is easier within the next five years.

Integration of different information sources (20%) was described in the answers for example as "collecting the fragments" that makes the information more valuable. In some of the responses it was hoped that the division between internal and external would not be made but the matter would be observed from a higher level. There was a need to link the internal and external information better with each other for example in the solution tool's windows. It was also believed that the company's internal data and external open data would be better integrated in the future. The respondents experienced that within the next five years combining the information from different information systems will get easier, and small and big systems are starting to communicate more fluently with each other.

It could be noticed from the answers that *BI is becoming part of everyday life and integrating to other activities (18%)*. It was forecasted that BI will be available in different hierarchical levels and in the future it is not thought only as the managements' "treasure chest". The respondents believed that BI will be standardized and connected more closely to the management processes. For example one respondent told that it will be normal to get a sales report to your mobile phone once a day. The respondents estimated that the users will have advanced opportunities to seek and analyze information on their own and that the information retrieval is getting more natural to the employees. In one response especially the external information retrieval and integration to the other BI activities were emphasized.

Network based working and interactivity (14%) were mentioned in the answers. For example it was estimated that the communities of practice and systems with interactive features were becoming more common. The exploitation of social media was forecasted to grow and the importance of companies' internal social media tools was estimated to emphasize. It was also mentioned that the co-operation will increase and thus the ownership of information is getting less important.

The respondents forecasted that within the next five years *the importance and appreciation of BI will still increase (12%).* In was mentioned that in the future the persons working with BI will more often members of management groups and board of directors.

In single responses it was estimated that the cause and effect factors are influencing in a longer range what requires expanding the observation from own industry also to other industries. It was also believed that the increasing demands from authorities would lead to examine more closely about what the information can be collected. There should be thus more attention made about the sensitivity of information. In one response the focus was estimated to shift from processes and tools to interpersonal activities and the psychological side.

6. DISCUSSION OF THE RESULTS

6.1. Key results and conclusion

From the year 2002 onwards the amount of companies that have BI activities has increased on every research evaluation in "Top 50" studies. From 2009 onwards BI has been part of companies' functions in every (100%) participating company (question 3). It can be thus stated that BI has established a steady position in the companies operating in Finland.

The BI terminology is still diverse and the amount of terms used about the matter seems to be rising compared to the situation in 2009. Also within one company the subject might have several terms. One term that has clearly increased its popularity is "liiketoimintatiedon hallinta" (eng. management of business information and knowledge or business intelligence) that was used as the primary term for the activity in 16% of the subject companies (question 5).

BI is not usually considered as a separate function but it is often dispersed in different functions of the company. For example 69% of the subject companies had not specified a separate strategy for BI (question 6) and 63% of the respondents stated that there is not a separate budget for BI (question 10). These attributes are in connection because from those 69% of the respondents that did not have a separate strategy 68% did not have own budget for BI either. BI strategies and budgets were examined more like a part of the companies' other strategies and budgets. The dispersed essence of BI is noticed also when observing how the responsibilities are entrusted. From the subject companies 53% does not have named one or two persons responsible for the company's BI activities (question 7).

The economic depression that was mentioned often in the 2009 "Top 50" study had smaller effect according to the 2013 study. The economical situation seemed better because the average of the BI budgets had increased (question 10). Also 83% of the companies are going to increase substantially or moderately the companies' investments in BI within the next five years (question 31). What is more, the importance and appreciation of BI is believed to increase in the future (question 38).

The investments in BI's technological solutions are likely to grow because methods such as measuring, data visualization and data mining are planned to start utilizing or substantially increase utilizing within the next year (question 34). From the companies increasing their investments in BI 27% mentioned that in the future they are going to concentrate more on information systems, data bases and different technologies

(question 33). The BI's technological solutions are going to be used especially in sales and marketing and in customership management (question 35). In the researcher's opinion it was quite surprising that even though there are many more advanced information sharing options available the popularity of e-mails was still strong. The importance of e-mail when delivering internal information products was evaluated highest (question 23) and every tenth company (10%) that obtained employees' BI mentioned e-mail as a tool to give feed back or as a tool to create questionnaires.

There is an increasing will to invest in BI because it is experienced that the BI is not on the level where it could be. The evaluation of success on BI's different areas was always under the average of four on the scale of 1 to 5 (question 28). From the respondents 61% mentioned that they were in a development stage with BI or that there were some points of improvement identified in BI (question 29). The most important areas of improvement turned out to be the better use of current BI's information systems and the ability to make more profound analyses (question 36). It seems that there has not been found solutions for the better use of current BI's information systems because this has been the most important point of improvement also in 2009.

Intelligence activities linked to external business information such as customer analysis, brand analysis, market analysis and news surveillance are outsourced completely or partly in most of the companies. Only competitor surveillance is normally done internally (question 11). Within the next three years the outsourcing of BI functions was normally believed to stay on the same level and there were more respondents that evaluated the importance of outsourcing to decrease more likely than to increase (question 37).

When comparing external and internal information products, external information products were seen less common (question 17) and when observing different functions of BI, the success in external business information was seen less significant than in internal business information (question 28). In the future the internal and external information are believed to be linked better together (question 38).

According to the observation based on different industries there can be noticed variation between the identified groups. For example on the field of real estate and construction none of the subject companies had a separate budget for BI where as in the field of manufacturing industry 57% of the companies had defined a separate budget for BI (question 10). Nevertheless, real estate and construction field has understood the importance of the activity because especially on this industry the investments in BI are going to increase within the next five years (question 31). Compared to the other industries the companies operating on the field of information technology, media and telecommunications evaluated their success the highest in applying BI's technological solutions (question 28). It could be also noticed that the importance of competitor

information and information regarding own industry are emphasized especially on the field of energy and real estate and construction (question 27).

The hypothetical trends identified in chapter 3.3. were tested mainly in question 37. Trends identified in the literature review and their corresponding options from the questionnaire are listed in table 6.1. with their averages. As seen in table 6.1., utilization of mobile technology and the increase of user friendliness and usability of technological tools were the most popular trends observed by the averages. In general the averages of the listed trends were over three in every case (see table 6.1.) what indicated that the importance of these trends is likely to increase within the next three years. From these hypothetical trends utilization of open data (avg. 3,36) was seen less important and thus it can be assumed that it is not affecting significantly companies' BI activities in the near future.

Table 6.1. *Hypothetical BI trends, their corresponding options in the questionnaire and their averages*

Hypothetical BI trends	**Trends tested in the questionnaire**	**Average**
Data features		
Analytics	Utilization of analytics	3,95
Real time data	Utilization of real time data	3,70
Big data	Utilization of big data	3,59
Open data	Utilization of open data	3,36
Technologies and supportive activities		
Usability of information systems	Increase of user friendliness and usability of technological tools	4,04
Mobile technology	Utilization of mobile technology	4,04
Information security	Acknowledge of information security	3,77
Cloud computing	Utilization of cloud services	3,66
Social media	Utilization of social media	3,59
BI is merged to everyday working methods and tools	BI is becoming part of everyday life and integrating to daily tools	3,55
New ways of working		
BI is used throughout the organization	Integration of BI as part of company's different functions	3,89
BI is brought closer to bigger user groups	Dissemination of business information on all hierarchical levels	3,63
BYOD	Use of own personal devices in BI functions	3,55

It can be noticed that BI trends have connections among them and that some of them are fundamentally linked to each other. This kind of joint effect of trends was revealed especially from the results of question 37 and 38. For example mobilization was seen one important trend in BI's future in question 38 and it was mentioned that it is supported by mobile devices, cloud services and the growing use of own personal

devices. Use of mobile devices, cloud services and own personal devices were seen as growing trends in question 37. These kinds of development directions can cause new improvements in information security that was also evaluated as a growing trend in question 37. Same kind of influence linkage can be detected when observing the increasing amount of data that was mentioned often in question 38. The current vast amount of data and the proactive preparation for the amount of data in the future has increased the importance of utilization of analytics that was rated third important trend in question 37. The joint effect of trends is illustrated in figure 6.1.

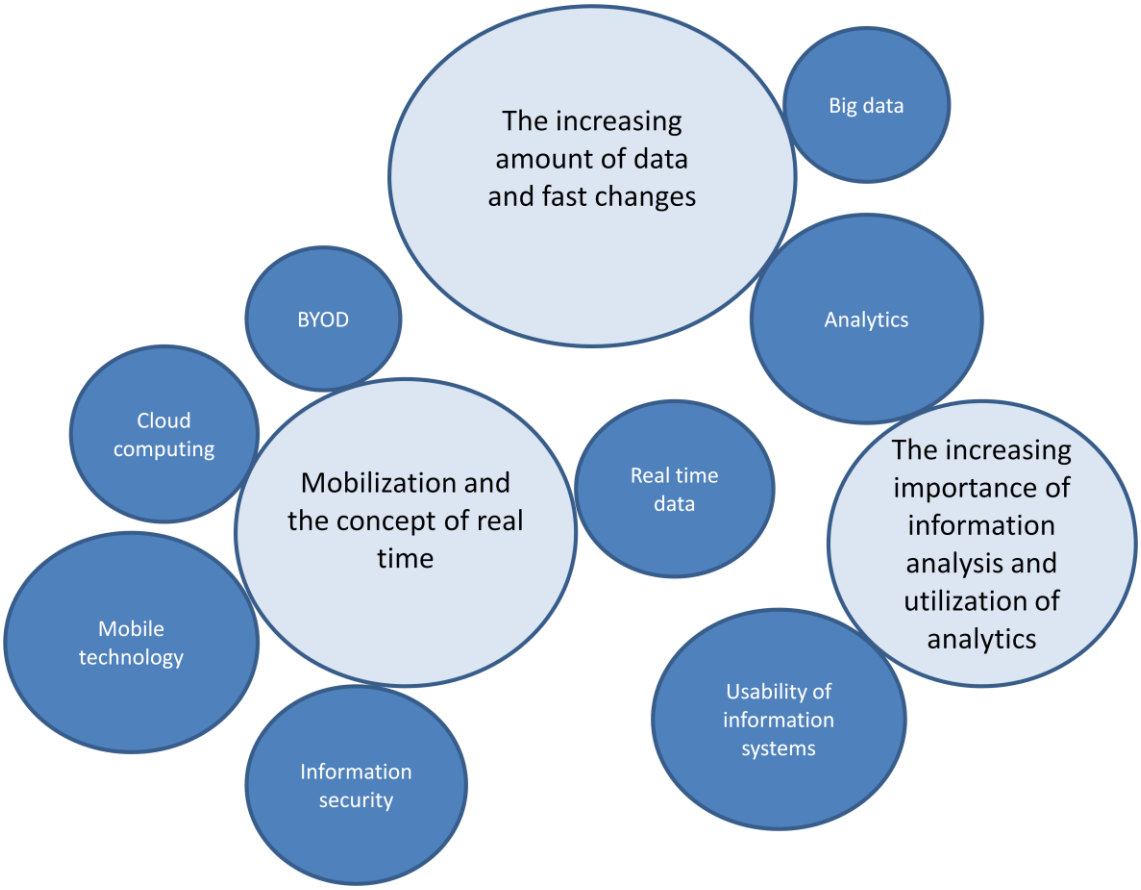

Figure 6.1. *The joint effect of three most remarkable BI development directions identified in the survey*

The three most remarkable BI development directions identified in question 38 are presented in the figure 6.1. with large light blue circles. The size of the circle indicates the occurrence of the development direction. The increasing amount of data and fast changes appeared the most in the answers and thus it is presented as the largest. The dark blue circles are the identified hypothetical trends that can be connected to these wider trend themes. The size of the smaller circles is presenting the significance of the trend (see figure 5.24.).

The state of business intelligence in companies operating in Finland and the main trends affecting on business intelligence field in Finland are revealed in the results presented in

chapters 5 and 6. In these chapters also the current ways of conducting business intelligence in target companies, the changes compared to the former results and the development directions of business intelligence are discussed. Thus the research questions presented in chapter 1.3. are being answered. The findings of this study can be used to understand better the BI applied by Finnish companies and to identify important BI trends.

6.2. Evaluation of the study

Evaluation of the study can be done by observing the Eco's requirements of a scientific research and the methodological choices presented in the chapter 1.5. These requirements and choices are gone through in the following.

1. *The research subject has to be precisely defined*

The research subject is precisely defined in the introduction and this information is supplemented in the survey execution, chapter 4. The need of the study is justified, the aims of the study are discussed and the different phases of the study are presented thus giving a comprehensive picture about the research subject.

2. *The research has to present something new that is not presented before or bring up something new when already known facts are presented from a new point of view*

The research is presenting results about the situation of business intelligence in Finland in 2013 that have not been studied before. The study takes also a unique point of view compared to other Finnish BI studies by dividing the companies into seven different industries and by comparing these groups.

3. *The research has to be useful also to others*

The results of this study give an opportunity to understand the situation of BI on different industries and also generally in Finland. Large Finnish companies can use the results to see what their situation is compared to the average. In addition companies offering BI solutions and services can use the results to indicate business opportunities and understand better the needs of their customers. The study results are also used as a material for a doctoral thesis.

4. *The research has to explain on what grounds the presented hypothesis are right or wrong and thus it has to have all the necessary elements to continue the public discussion about the matter*

The aim of the study was to see how the overall situation of BI has developed compared to former studies. To achieve this aim research questions were presented in the chapter

1.3. The theoretical part combined the different approaches of BI and created an overview of the matter from history till today. Also hypothetical BI trends were presented in the study. The empirical part on the other hand gave the present ideas and developments of BI in the form of study results. Together these two sections complete each other and answer the presented research questions.

The discussion of the results is presented in the chapter 6 which emphasizes the most interesting results and connects them to other relevant results. This kind of linkage helps to form a bigger picture of the results and it gives a good starting point to continue the public discussion about the matter. In the chapter 6.4. further research themes are presented to give ideas how the research could be continued.

As presented in figure 1.1. *the study was conducted based on descriptive research design*. The chosen research design served well the needs of the study because the aim was to get a comprehensive picture about the current BI situation in Finland and identify BI trends. The research problem was well defined and that helped to structure the research and define precise procedures how the study is conducted. However, the necessary interaction between the researcher and companies might have disturbed the data collection. For example the researcher and the research subjects might have made misinterpretations and thus affected the results. In this study, in order to get a true and precise picture of the BI situation there was a need to get extensive amount of participating companies to generalize the results.

The results can be viewed as representative of the state of BI in the subject companies and because the number of participants was 56 it can be assumed that the results can be generalized also to other large Finnish companies. It is worth noting that the results might not apply to smaller companies in Finland or to other countries. As illustrated in table 4.1. there were 6 to 13 companies presenting the different industries. In this case the sizes of the individual groups are not extensive enough to give an accurate picture of the BI situation in specific industries. However they give a prediction how these industries are positioned in the field of BI.

Survey research was used as the research strategy to assess the needed information from a defined sample of companies in a standard form. In addition survey research enabled to conduct the study in the defined budget and timetable. With the chosen research strategy it was possible to describe, compare and explain the current state of BI in Finland and be able to generalize the results to a wider group than the chosen sample. Anyhow, it has to be kept in mind that the bias of the researcher might affect the results of the survey research. Accurate interpretation and critical observation of the results were obeyed to avoid misinterpretation and false results. Another disadvantage of survey research was that it did not allow collect detailed and profound information about the companies because the predetermined structure had to be obeyed.

The chosen method of the study was a survey. It is observed in detail because the method is an important part of the study and without it the collected data could have been different. Because the survey was conducted in a structured form it gave the opportunity to interview numerous different companies. In the given timetable it would not have been possible to do as many unstructured interviews. What is more, the given answers would not have been comparable in the same way as in a structured survey. Also to maintain the comparability to the former "Top 50" –studies the same method was used.

A structured survey form has its limitations in expressing different ideas. For example in the survey internal and external business information were described and used in the questions even though this kind division is not the only point of view in BI. Interviewees could have also understood differently some terms that were used in the survey even though that some of the terms were explained in the cover letter or explained by the interviewer if needed. What is more, the respondents were presenting different industrial groups where companies' functions can vary and the points of view can be different. For example the function "supply chain management" mentioned in some of the questions might be interpreted from the company's point of view and in some cases this function was not identified at all.

In the survey form many questions had lists of options that had to be valued. For example in the question 37 (appendix 1) different hypothetical trends were presented. These trends were identified using mainly article archives in the internet and the list was probably not extensive because it was reflecting the media's opinion of important matters. Also the main idea of these trends was condensed into few words and thus they might have been understood differently. In order to have more flexibility in the survey almost all the questions were completed with the possibility to give own suggestions. The answers to open ended questions were not recorded and the researcher had to type down the answers during the interview. Thus some ideas might have been left outside the results or the responses might have been interpreted in a biased manner. What is more the data gained with the open ended questions was more difficult to quantify than the answers to the multiple choice questions. Considering that there were only nine open ended questions and that normally the answers were compact, it can be assumed that all the answers were captured.

It was essential that the survey was conducted in a form of a telephone interview. It was noticed that answers given independently only via the online survey were not as extensive as the ones received during the interviews. The specific time set for the telephone interview bound the interviewees to answer the survey where as an online link to the survey could have been easily forgotten. Telephone interviews were also easy method for the interviewees because they did not need to type down anything nor think how to put their ideas into text form. Although the telephone interview was suitable

method, it did not allow the researcher to observe respondents' nonverbal behavior during the interviews. This might lead to additional misinterpretation.

6.3. Further research themes

In the future the research series could be continued to understand better the development of business intelligence in Finland. Also more comprehensive comparison could be done between all the former studies to find development patterns in a longer scale. In the next prospective research the different industries should have more participants in order to have more inclusive examination and more reliable results that can be generalized. Perhaps these different groups can even be the main starting point where as the importance of revenue can be secondary attribute. If the realization of the study would be similar to former studies, it would be good to continue to collect the material with telephone interviews. This would ensure the high answer rate and the quality of the answers. In addition it might be convenient to give possibility to participate in the survey in Finnish or in English. There were already some cases where the company would have preferred to answer the questions in English.

To get a wider picture of the different industries, it would be interesting to do case studies about one or two companies from each group. More than one person could be interviewed from the subject company and possibly some workshops could be organized. This way the state of BI could be captured more precisely. In these case studies the aim could be to create a comprehensive picture how the business intelligence is organized and managed in the subject companies and how this situation could be developed to meet the needs of the decision making.

The research could be continued also from the trends' point of view. It would be interesting to see how BI trends are linked to each other and are some trends born only because of the influence of other trends. For example if employees want to work where ever, when ever and to have device independent access to information, has the mobile technology been the influence that has made this trend to happen or has the mobile technology developed to meet the needs of this trend. This kind of observation could help to understand the evolution of current trends and to predict forthcoming trends, and thus help the companies to know how they should develop their business intelligence.

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APPENDICES (2 pieces)

1. Questionnaire (in Finnish)

2. Cover letter (in Finnish)

3. Questionnaire (in English)

Liiketoimintatiedon hallinta suomalaisissa yrityksissä vuonna 2013

1. Taustatiedot

Yritys / Konserni

_____

Vastaajan nimi

_____

Vastaajan asema yrityksessä

_____

2. Toimiala

◯ a) Hyvinvointipalvelut ja terveydenhuolto

◯ b) Kiinteistöt ja rakentaminen

◯ c) Kuluttajatuotteet ja kaupan ala

◯ d) Pankki- ja rahoitustoiminta, vakuutus ja omaisuudenhoito

◯ e) Teknologia, media ja telekommunikaatio

◯ f) Teollisuus ja energia

◯ g) Muu, mikä?

_____

A. TOIMINNAN MÄÄRITTELY

3. Onko yrityksessänne tai konsernissanne (jäljempänä yritys) tietoisesti toteutettua toimintaa omaan liiketoimintaan tai liiketoimintaympäristöön liittyvän tiedon keräämiseksi ja analysoimiseksi?

◯ a) Kyllä

◯ b) Ei. (Vastatkaa kysymykseen 4. ja siirtykää kysymykseen 33.)

4. Mitkä ovat tärkeimmät keinot ja työkalut, joiden avulla yrityksenne johto pysyy ajan tasalla yrityksen tilanteesta?

_____

_____

_____

5. Millä nimellä tätä toimintaa kutsutaan?

◯ a) Business Intelligence

◯ b) Competitive Intelligence

◯ c) Liiketoimintatiedon hallinta

◯ d) Market Intelligence

◯ e) Tiedolla johtaminen

◯ f) Jokin muu, mikä?

_____

Jatkossa kyseiseen toimintaan viitataan tässä kyselyssä termillä liiketoimintatiedon hallinta.

B. LIIKETOIMINTATIEDON HALLINNAN ORGANISOINTI

6. Onko yrityksellenne määritelty erillinen strategia liiketoimintatiedon hallinnalle?

○ a) Kyllä

○ b) Ei

7. Onko sisäisen ja ulkoisen liiketoimintatiedon hallinnalle nimetty päävastuullinen henkilö?

○ a) **Kyllä**, *yksi ja sama henkilö* vastaa sekä sisäisestä että ulkoisesta liiketoimintatiedon hallinnasta.
Liiketoimintatiedon hallinnan päävastuullisen henkilön asema yrityksessä:

_____

○ b) **Kyllä**, *kaksi henkilöä*, joista toinen vastaa sisäisestä ja toinen ulkoisesta liiketoimintatiedon hallinnasta.
Sisäisen ja ulkoisen liiketoimintatiedon hallinnan päävastuullisten henkilöiden asemat yrityksessä:

_____

○ c) **Ei**. Kuka yrityksessänne vastaa sisäisestä ja ulkoisesta liiketoimintatiedon hallinnasta?

_____

8. Kenen/keiden alaisuudessa liiketoimintatiedon hallinnasta vastaavat henkilöt työskentelevät?

1) Henkilön asema yrityksessä: _____
Osasto: _____

2) Henkilön asema yrityksessä: _____
Osasto: _____

3) Henkilön asema yrityksessä: _____
Osasto: _____

9. Kuinka monta henkilöä liiketoimintatiedon hallinta työllistää...

...kokopäiväisesti? _____

...osapäiväisesti? _____

10. Onko liiketoimintatiedon hallinnalla omaa budjettia?

a) Kyllä. Kuinka suuri budjetti on?

○ _____

○ b) Ei.

11. Mitä seuraavista toiminnoista hyödynnätte yrityksenne toiminnan tukena ja mitä näistä toiminnoista olette ulkoistaneet?

	Toiminto hoidetaan sisäisesti	Toiminto on ulkoistettu osittain	Toiminto on ulkoistettu kokonaan	Toimintoa ei hyödynnetä yrityksessä
a) Asiakastutkimukset	○	○	○	○
b) Brändititutkimukset	○	○	○	○
c) Kilpailijaseuranta	○	○	○	○
d) Markkinatutkimukset	○	○	○	○
e) Uutisseuranta	○	○	○	○
f) Jokin muu, mikä? _____	○	○	○	○
g) Jokin muu, mikä? _____	○	○	○	○

12. Ketkä ovat liiketoimintatiedon hallinnan keskeisiä käyttäjiä yrityksessänne? Arvioikaa käyttäjäryhmiä sen mukaan, kuinka tärkeää liiketoimintatiedon hallinnan tuottama tieto niille on.

(1 = ei lainkaan tärkeää, 5 = erittäin tärkeää)

	1	2	3	4	5
a) Ylin johto	○	○	○	○	○
b) Keskijohto	○	○	○	○	○
c) Asiantuntijat	○	○	○	○	○
d) Muu henkilöstö	○	○	○	○	○

13. Missä yrityksenne toiminnoissa liiketoimintatiedon hallinnan tuottamaa tietoa käytetään? Arvioikaa oheisia toimintoja tiedon hyödyntämismäärän perusteella.

(1 = ei käytetä lainkaan, 5 = käytetään erittäin paljon)

	1	2	3	4	5
a) Asiakkuuksien hallinta	○	○	○	○	○
b) Henkilöstöhallinto	○	○	○	○	○
c) Myynti ja/tai markkinointi	○	○	○	○	○
d) Strateginen liiketoiminnan suunnittelu ja kehittäminen	○	○	○	○	○
e) Taloushallinto	○	○	○	○	○
f) Toimitusketjun hallinta	○	○	○	○	○
g) Tuotannon ohjaus	○	○	○	○	○
h) Tuotannon suunnittelu ja laatu	○	○	○	○	○
i) Tuote- ja teknologiakehitys	○	○	○	○	○
j) Jokin muu, mikä? _____	○	○	○	○	○
k) Jokin muu, mikä? _____	○	○	○	○	○

14. Mihin tarkoitukseen liiketoimintatiedon hallinnan tuottamaa tietoa käytetään yrityksessänne? Arvioikaa oheisia prosesseja tiedon hyödyntämismäärän perusteella.

(1 = ei käytetä lainkaan, 5 = käytetään erittäin paljon)

	1	2	3	4	5
a) Budjetointiin	○	○	○	○	○
b) Henkilöstön ohjaamiseen	○	○	○	○	○
c) Liiketoiminnan seurantaan	○	○	○	○	○
d) Strategiseen suunnitteluun	○	○	○	○	○
e) Talouden ennustamiseen	○	○	○	○	○
f) Tavoitteiden asetantaan	○	○	○	○	○
g) Tulevaisuuden ennustamiseen	○	○	○	○	○
h) Jokin muu, mikä? _____	○	○	○	○	○
i) Jokin muu, mikä? _____	○	○	○	○	○

15. Millaisia keinoja yrityksessänne käytetään tiedon keräämiseksi henkilöstöltä?

_____

_____

_____

C. LIIKETOIMINTATIEDON HALLINNAN MENETELMÄT JA TYÖKALUT

16. Mitä seuraavista keinoista yrityksenne liiketoimintatiedon hallinnasta vastaava taho hyödyntää pyrkiessään tunnistamaan käyttäjien kriittiset tietotarpeet?

(1 = ei lainkaan, 5 = erittäin paljon)

	1	2	3	4	5
a) Kyselylomakkeet	○	○	○	○	○
b) Mutu-tuntuma	○	○	○	○	○
c) Palautesivustot	○	○	○	○	○
d) Tiedon käyttäjien haastatteleminen	○	○	○	○	○
e) Tiedon käytön seuraaminen (esim. tiedostojen latausmäärät)	○	○	○	○	○
f) Yleinen vuorovaikutus ja keskustelu käyttäjien kanssa	○	○	○	○	○
g) Jokin muu, mikä? _____	○	○	○	○	○
h) Jokin muu, mikä? _____	○	○	○	○	○

17. Kuinka yleisiä seuraavat tietotuotetyypit ovat yrityksenne *sisäisessä* liiketoimintatiedon hallinnassa?

(1 = ei hyödynnetä lainkaan, 5 = hyödynnetään erittäin paljon)

	1	2	3	4	5
a) Ad hoc –tyyppiset tapauskohtaiset selvitykset	○	○	○	○	○
b) Ennalta määriteltyihin tietotarpeisiin perustuvat tietotuotteet	○	○	○	○	○

18. Kuinka yleisiä seuraavat tietotuotetyypit ovat yrityksenne *ulkoisessa* liiketoimintatiedon hallinnassa?

(1 = ei hyödynnetä lainkaan, 5 = hyödynnetään erittäin paljon)

	1	2	3	4	5
a) Ad hoc –tyyppiset tapauskohtaiset selvitykset	○	○	○	○	○
b) Ennalta määriteltyihin tietotarpeisiin perustuvat tietotuotteet	○	○	○	○	○

19. Kuinka monta erilaista säännöllistä sisäistä tietotuotetta yrityksenne tuottaa?

◯ a) Ei yhtään

◯ b) 1–5

◯ c) 6–10

◯ d) Yli 10

20. Arvioikaa seuraavien analyysimenetelmien ja -työkalujen tärkeyttä yrityksenne liiketoimintatiedon analysoinnissa.

(0 = en osaa sanoa, 1 = ei lainkaan tärkeä, 5 = erittäin tärkeä)

	0	1	2	3	4	5
a) Arvoketju-/arvoverkkoanalyysi	◯	◯	◯	◯	◯	◯
b) Benchmarking	◯	◯	◯	◯	◯	◯
c) Erottuvuustekijöiden analyysi	◯	◯	◯	◯	◯	◯
d) Finanssianalyysi	◯	◯	◯	◯	◯	◯
e) Kilpailutekijöiden analyysi	◯	◯	◯	◯	◯	◯
f) Muutosvoima-analyysi	◯	◯	◯	◯	◯	◯
g) Patenttianalyysi	◯	◯	◯	◯	◯	◯
h) PESTEL/APESTE/STEEP	◯	◯	◯	◯	◯	◯
i) Porterin viiden voiman analyysi	◯	◯	◯	◯	◯	◯
j) Portfolioanalyysi	◯	◯	◯	◯	◯	◯
k) Riskianalyysi	◯	◯	◯	◯	◯	◯
l) Skenaariot	◯	◯	◯	◯	◯	◯
m) Strategy canvas/Strategiakartta	◯	◯	◯	◯	◯	◯
n) SWOT	◯	◯	◯	◯	◯	◯
o) Teknologian ennakointi	◯	◯	◯	◯	◯	◯
p) Trendianalyysi	◯	◯	◯	◯	◯	◯
q) Yrityksen maineen analyysi	◯	◯	◯	◯	◯	◯
r) Yritys-, markkina- ja/tai henkilöprofilointi	◯	◯	◯	◯	◯	◯
s) Jokin muu, mikä? _____	◯	◯	◯	◯	◯	◯
t) Jokin muu, mikä? _____	◯	◯	◯	◯	◯	◯

21. Kuinka paljon hyödynnätte seuraavia menetelmiä sisäisistä tietojärjestelmistä saatavien tietojen analysoinnissa?

(1 = ei lainkaan, 5 = erittäin paljon)

	1	2	3	4	5
a) Ad hoc -kysely ja -raportointi	○	○	○	○	○
b) Mittaamisjärjestelmät (balanced scorecard, prosessimittarit tms.)	○	○	○	○	○
c) Moniulotteinen analyysi, OLAP	○	○	○	○	○
d) Suunnittelun ratkaisut (budjetointi, ennustaminen)	○	○	○	○	○
e) Tiedon louhinta (data mining)	○	○	○	○	○
f) Tiedon visualisointi	○	○	○	○	○
g) Jokin muu, mikä? _____	○	○	○	○	○
h) Jokin muu, mikä? _____	○	○	○	○	○

22. Kuinka paljon yrityksen eri toiminnot hyödyntävät tiedon analysoinnissa liiketoimintatiedon hallinnan teknisiä ratkaisuja?

(1 = ei lainkaan, 5 = erittäin paljon)

	1	2	3	4	5
a) Asiakkuuksien hallinta	○	○	○	○	○
b) Henkilöstöhallinto	○	○	○	○	○
c) Myynti ja/tai markkinointi	○	○	○	○	○
d) Strateginen liiketoiminnan suunnittelu ja kehittäminen	○	○	○	○	○
e) Taloushallinto	○	○	○	○	○
f) Toimitusketjun hallinta	○	○	○	○	○
g) Tuotannon ohjaus	○	○	○	○	○
h) Tuotannon suunnittelu ja laatu	○	○	○	○	○
i) Tuote- ja teknologiakehitys	○	○	○	○	○
j) Jokin muu, mikä? _____	○	○	○	○	○

23. Kuinka tärkeitä seuraavat kanavat ovat yrityksenne sisäisten tietotuotteiden jakamisessa?
(1 = ei lainkaan tärkeä, 5 = erittäin tärkeä)

	1	2	3	4	5
a) Henkilökohtainen esitys	○	○	○	○	○
b) Infotilaisuudet	○	○	○	○	○
c) Intranet	○	○	○	○	○
d) Puhelinkeskustelu	○	○	○	○	○
e) Sähköposti	○	○	○	○	○
f) Sosiaalinen media	○	○	○	○	○
g) Yrityksen sisäiset vuorovaikutteiset välineet (esim. pikaviestinsovellukset)	○	○	○	○	○
h) Liiketoimintatiedon hallinnan portaali	○	○	○	○	○
i) Jokin muu, mikä? _____	○	○	○	○	○

D. LIIKETOIMINTATIEDON HALLINNAN HYÖDYT

24. Arvioikaa yrityksenne liiketoimintatiedon hallinnalla saavutettuja hyötyjä. Liiketoimintatiedon hallinnan avulla on…

(1 = ei sovellu yritykseemme, 5 = soveltuu yritykseemme erittäin hyvin)

	1	2	3	4	5
a) aikaistettu uhkien ja mahdollisuuksien havaitsemista.	○	○	○	○	○
b) parannettu asiakas- tai tuotekannattavuutta.	○	○	○	○	○
c) järkiperäistetty tiedon keräämistä ja analysointia.	○	○	○	○	○
d) kasvatettu myyntiä ja markkinaosuuksia.	○	○	○	○	○
e) kasvatettu yleistä tietopohjaa.	○	○	○	○	○
f) lisätty tiedon jakamista organisaatiossa.	○	○	○	○	○
g) nopeutettu päätöksentekoprosesseja.	○	○	○	○	○
h) optimoitu hankintoja ja kustannuksia.	○	○	○	○	○
i) parannettu tuotannon/tuotteiden laatua.	○	○	○	○	○
j) saatu laadukkaampaa tietoa päätöksenteon tueksi.	○	○	○	○	○
k) saavutettu kustannussäästöjä.	○	○	○	○	○
l) säästetty aikaa.	○	○	○	○	○
m) tehostettu operatiivista raportointia.	○	○	○	○	○
n) saatu päätöksentekijät ymmärtämään tiedon merkitys liiketoiminnalle.	○	○	○	○	○
o) tunnistettu uusia liiketoimintamahdollisuuksia.	○	○	○	○	○
p) parannettu resurssien suunnittelua.	○	○	○	○	○
q) vahvistettu kilpailukykyä (esim. kilpailuetutekijöiden tunnistamisen kautta).	○	○	○	○	○
r) nopeutettu reagointia kilpailutilanteessa.	○	○	○	○	○
s) tehostettu strategisten päämäärien/tavoitteiden asettamista.	○	○	○	○	○
t) tehostettu strategian (polku tavoitteeseen) määrittämistä.	○	○	○	○	○
u) Jokin muu, mikä? _____	○	○	○	○	○
v) Jokin muu, mikä? _____	○	○	○	○	○

25. Mittaatteko liiketoimintatiedon hallinnasta saatuja hyötyjä?

Kyllä. Miten?

○ _____

Ei. Miksi ei?

○ _____

26. Keräättekö käyttäjiltä palautetta liiketoimintatiedon hallinnasta?

Kyllä. Miten?

○ _____

Ei. Miksi ei?

○ _____

27. Ohessa on lueteltu tietotarpeita, joihin liiketoimintatiedon hallinnalla useimmiten pyritään vastaamaan. Arvioikaa oheisten tietotarpeiden tärkeyttä yrityksellenne.

(1 = ei lainkaan tärkeä, 5 = erittäin tärkeä)

	1	2	3	4	5
a) Asiakkaiden toimialaa koskeva tieto	○	○	○	○	○
b) Asiakkaita koskeva tieto	○	○	○	○	○
c) Kilpailijoita koskeva tieto	○	○	○	○	○
d) Markkinakohtainen tieto	○	○	○	○	○
e) Omaa toimialaa koskeva tieto	○	○	○	○	○
f) Rinnakkaisiin toimialoihin liittyvä tieto	○	○	○	○	○
g) Teknologioita koskeva tieto	○	○	○	○	○
h) Taloussuhdanteita ja makrotrendejä koskeva tieto	○	○	○	○	○
i) Omia liiketoimintaprosesseja koskeva tieto	○	○	○	○	○
j) Tuote- ja asiakaskannattavuustieto	○	○	○	○	○
k) Jokin muu, mikä? _____	○	○	○	○	○
l) Jokin muu, mikä? _____	○	○	○	○	○

28. Kuinka hyvin koette onnistuvanne seuraavilla osa-alueilla?

(1 = huonosti, 5 = erinomaisesti)

	1	2	3	4	5
a) Sisäisen liiketoimintatiedon hallinta	○	○	○	○	○
b) Ulkoisen liiketoimintatiedon hallinta	○	○	○	○	○
c) Liiketoimintatiedon analysointi	○	○	○	○	○
d) Liiketoimintatiedon hyödyntäminen operatiivisessa päätöksenteossa	○	○	○	○	○
e) Liiketoimintatiedon hyödyntäminen strategisessa päätöksenteossa	○	○	○	○	○
f) Liiketoimintatiedon hallinnan teknisten ratkaisuiden hyödyntäminen	○	○	○	○	○
g) Tiedon kerääminen henkilöstöltä	○	○	○	○	○
h) Liiketoimintatiedon hallinta kokonaisuutena	○	○	○	○	○

29. Mahdollisuus perustella edellisen kysymyksen vastauksia:

_____

_____

_____

30. Mihin kysymyksiin haluaisitte saada vastauksia liiketoimintatiedon hallinnan avulla?

_____

_____

_____

TULEVAISUUS

31. Uskotteko, että yrityksenne panostukset liiketoimintatiedon hallintaan tulevat seuraavan viiden vuoden aikana…

◯ a) kasvamaan huomattavasti

◯ b) kasvamaan hieman

◯ c) pysymään samansuuruisina

◯ d) pienenemään hieman

◯ e) pienenemään huomattavasti

32. Mahdollisuus perustella edellisen kysymyksen vastauksia:

_____

_____

_____

33. Mihin liiketoimintatiedon hallinnan osa-alueisiin tullaan panostamaan…

a)… samalla tavalla kuin aikaisemmin?

_____

_____

b)…enemmän kuin aikaisemmin?

_____

_____

c)…vähemmän kuin aikaisemmin?

_____

_____

34. Mitä seuraavista menetelmistä aiotte ottaa käyttöön tai merkittävästi laajentaa seuraavan vuoden aikana?

☐ a) Ad hoc -kysely ja -raportointi

☐ b) Mittaamisjärjestelmät (balanced scorecard, prosessimittarit tms.)

☐ c) Moniulotteinen analyysi, OLAP

☐ d) Suunnittelun ratkaisut (budjetointi, ennustaminen)

☐ e) Tiedon louhinta (data mining)

☐ f) Tiedon visualisointi

☐ g) Jokin muu, mikä?

_____

☐ h) Jokin muu, mikä?

_____

☐ i) Ei mitään näistä

35. Missä toiminnoissa aiotte ottaa käyttöön tai merkittävästi kasvattaa liiketoimintatiedon hallinnan teknisten ratkaisujen hyödyntämistä seuraavan vuoden sisällä?

☐ a) Asiakkuuksien hallinta

☐ b) Henkilöstöhallinto

☐ c) Myynti ja/tai markkinointi

☐ d) Strateginen liiketoiminnan suunnittelu ja kehittäminen

☐ e) Taloushallinto

☐ f) Toimitusketjun hallinta

☐ g) Tuotannon ohjaus

☐ h) Tuotannon suunnittelu ja laatu

☐ i) Tuote- ja teknologiakehitys

☐ j) Ei missään

36. Arvioikaa liiketoimintatiedon hallinnan mahdollisia kehittämiskohteita yrityksessänne.

(1 = ei lainkaan tärkeä, 5 = erittäin tärkeä)

	1	2	3	4	5
a) Aikataulujen pitävyys	○	○	○	○	○
b) Analyysikapasiteetin kasvattaminen	○	○	○	○	○
c) Henkilöstön kiinnostuksen lisääminen	○	○	○	○	○
d) Henkilöstön osaaminen	○	○	○	○	○
e) Henkilöstöresurssit	○	○	○	○	○
f) Johdon sitoutuminen	○	○	○	○	○
g) Kriittisten tietotarpeiden tunnistaminen	○	○	○	○	○
h) Nykyisten liiketoimintatiedon hallinnan järjestelmien parempi ja laajempi hyödyntäminen	○	○	○	○	○
i) Organisaation sisäisen tiedon hyödyntäminen	○	○	○	○	○
j) Sopivien tietojärjestelmien tai työkalujen kehittäminen	○	○	○	○	○
k) Tiedon jalostusasteen syventäminen	○	○	○	○	○
l) Toiminnan hyödyllisyyden mittaaminen	○	○	○	○	○
m) Toiminnan tuotteistaminen	○	○	○	○	○
n) Toiminnan kyky priorisoida ja vastata tietotarpeisiin	○	○	○	○	○
o) Kyky suojautua kilpailijan vastaavalta toiminnalta	○	○	○	○	○
p) Tiedon jakamisen tehostaminen	○	○	○	○	○
q) Tiedon hankinnan tehostaminen	○	○	○	○	○
r) Jokin muu, mikä? _____	○	○	○	○	○

37. Arvioi alla esitettävien trendien merkityksen kehittymistä yrityksessänne liiketoimintatiedon hallinnan saralla kolmen vuoden aikajänteellä:

(1 = merkitys laskee huomattavasti, 2 = merkitys laskee jonkin verran, 3 = merkitys pysyy ennallaan, 4 = merkitys kasvaa jonkin verran, 5 = merkitys kasvaa huomattavasti)

	1	2	3	4	5
a) Mobiilin teknologian hyödyntäminen	○	○	○	○	○
b) Pilvipalveluiden hyödyntäminen	○	○	○	○	○
c) Big datan hyödyntäminen	○	○	○	○	○
d) Analytiikan hyödyntäminen	○	○	○	○	○
e) Avoimen datan hyödyntäminen	○	○	○	○	○
f) Reaaliaikaisen datan hyödyntäminen	○	○	○	○	○
g) Sosiaalisen median hyödyntäminen	○	○	○	○	○
h) Teknisten työkalujen helppokäyttöisyyden ja omaksuttavuuden kehittäminen	○	○	○	○	○
i) Tietoturvallisuuden huomioiminen	○	○	○	○	○
j) Liiketoimintatiedon hallinnan arkipäiväistyminen ja sulautuminen jokapäiväisiin työkaluihin (esim. PowerPoint ja Excel -työkalujen kehittymisen kautta)	○	○	○	○	○
k) Omien henkilökohtaisten laitteiden, kuten tietokoneen ja puhelimen, käyttö liiketoimintatiedon hallinnan toiminnoissa	○	○	○	○	○
l) Liiketoimintatiedon jakaminen kaikilla yrityksen hierarkiatasoilla	○	○	○	○	○
m) Liiketoimintatiedon integrointi osaksi yrityksen eri toimintoja	○	○	○	○	○
n) Erilaisten liiketoimintatiedon hallinnan ratkaisuiden yhteensovittaminen	○	○	○	○	○
o) Ulkomaalaisten liiketoimintatiedon hallinnan palveluntarjoajien hyödyntäminen	○	○	○	○	○
p) Liiketoimintatiedon hallinnan toimintojen ulkoistaminen	○	○	○	○	○
q) Työntekijöiden oma-aloitteinen tiedonhaku	○	○	○	○	○
r) Juridinen säätely, sertifiointivaatimukset ja muut valvontaympäristön vaatimukset	○	○	○	○	○
s) Jokin muu, mikä? _____	○	○	○	○	○
t) Jokin muu, mikä? _____	○	○	○	○	○

38. Millaisia yleisiä muutoksia uskotte liiketoimintatiedon hallinnassa tapahtuvan seuraavan viiden vuoden aikana?

_____

_____

TAMPEREEN TEKNILLINEN YLIOPISTO
Tiedonhallinnan ja logistiikan laitos

11.3.2013

LIIKETOIMINTATIEDON HALLINTA SUOMALAISISSA YRITYKSISSÄ

Arvoisa vastaanottaja,

Päätöksentekoa tukeva laadukas ja oikea-aikainen tieto on tämän päivän liiketoimintaympäristössä keskeinen kilpailukyvyn edellytys. Käsitteellä liiketoimintatiedon hallinta (engl. business intelligence, BI) viitataan sekä yrityksen johtamisen kannalta oleelliseen tietoon että toimintaan, joka mahdollistaa kyseisen tiedon jalostamisen päätöksenteon tueksi.

Tampereen teknillinen yliopisto (TTY) on toteuttanut vuosina 2002, 2005, 2007 ja 2009 tutkimuksen, jossa on selvitetty liiketoimintatiedon hallinnan soveltamistapoja suomalaisissa suuryrityksissä. Aikaisemmilla tutkimuskerroilla lähes jokainen lähestytty yritys on ottanut osaa tutkimukseemme. Vuoden 2013 tutkimus toteutetaan edelliskertojen tapaan kyselytutkimuksena. Edellisistä vuosista poiketen haastattelu ei kohdistu vain 50 suurimpaan suomalaiseen yritykseen, vaan puhelimitse haastatellaan Suomen 500 suurimman yrityksen joukosta kuudelta eri toimialalta noin 60 eri yritystä. Vastaajiksi haemme liiketoimintatiedon hallinnasta vastaavia henkilöitä. Tavoitteena on selvittää, *miten Suomessa toimivat isot yritykset toteuttavat liiketoimintatiedon hallintaa ja mihin suuntaan se on kehittymässä.*

Tutkimuksessa käytettävä kysymyslomake on tämän sähköpostin liitteenä, jotta voitte tutustua siihen etukäteen. Puhelinhaastattelut tehdään 11.3.–30.4.2013 välisenä aikana. Vastaamiseen kuluu aikaa noin 40 minuuttia. Tutkimuksen tulokset julkaistaan siten, ettei niistä voi tunnistaa yksittäisiä yrityksiä.

Kaikki vastaajat saavat **kirjallisen raportin** kyselytutkimuksen tuloksista kesällä 2013. Lisäksi raportin valmistumisen jälkeen järjestämme tuloksia esittelevän **seminaarin**, johon tutkimukseen vastanneet henkilöt saavat kutsun.

Tutkimuksen toteuttaa TTY:n tiedonhallinnan ja logistiikan laitos. Tutkimuksen tuloksia käytetään aihealueen tieteellisen tutkimuksen edistämiseksi ja suomalaisen elinkeinoelämän kilpailukyvyn kehittämiseksi. Tutkimuksen rahoittavat TTY sekä KPMG.

Toivomme, että voisitte olla tukemassa tärkeää tutkimusta varaamalla aikaanne puhelin-haastattelua varten Teille sopivana ajankohtana. Jos haluatte lisätietoja tutkimuksesta tai kyselystä, olkaa ystävällinen ja ottakaa yhteyttä Tuuli Tyrväiseen (email: tuuli.tyrvainen@tut.fi, puh. 050-3010160), Timo Tuomenpuroon (puh. 050-3780529) tai prof. Mika Hannulaan (puh. 0400-331838).

Ystävällisin terveisin,

Mika Hannula	Tuuli Tyrväinen	Timo Tuomenpuro
Professori	Tutkimusapulainen	Tohtoriopiskelija

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TUTKIMUKSESSA KÄYTETTYJÄ KÄSITTEITÄ

Liiketoimintatiedon hallinta
Liiketoimintatiedon hallinnalla tarkoitetaan kaikkea sellaista toimintaa, jonka avulla yritys tietoisesti kerää, analysoi ja hyödyntää omaan toimintaansa ja liiketoimintaympäristöönsä liittyvää tietoa päätöksenteon tueksi.

Sisäinen liiketoimintatieto
Yrityksen sisältä saatava, pääsääntöisesti sen omaa toimintaa koskeva tieto, kuten esimerkiksi tuotanto- ja myyntiluvut.

Ulkoinen liiketoimintatieto
Yrityksen ulkopuolelta saatava, pääsääntöisesti sen kilpailijoita ja muuta ympäröivää toimintaa koskeva tieto, kuten esimerkiksi omaa toimialaa koskevat ajankohtaiset uutiset.

Tietotuote
Tietotuotteita ovat esimerkiksi kilpailijaprofiilit, myyntiennusteet, päivittäiset tiivistelmät uutisseurannasta, asiakastyytyväisyysraportit, kuukausittaiset markkina-analyysit ja muut liiketoiminnan ohjaamiseen liittyvät raportit.

Ad hoc -selvitys
Jotain tiettyä ennakoimatonta tarvetta varten tehty kertaluontoinen selvitys, raportti tai vastaava.

Tarvekohtainen selvitys
Jotain tiettyä tilannetta tai tarvetta varten tehty selvitys, joka ollaan kenties tehty ennenkin ja voidaan toistaa tarpeen mukaan. Näitä voivat olla esimerkiksi omia ja kilpailijoiden hintoja vertaileva hintatutkimus, joka tehdään satunnaisesti tarpeen vaatiessa tai konsulttiyritykseltä ostettava bränditutkimus.

Liiketoimintatiedon hallinnan tekniset ratkaisut
Erilaiset tekniset analyysityökalut sekä business intelligence -ohjelmistot ja portaalit, joiden pääasiallinen tarkoitus on liiketoimintatiedon jalostaminen ja jakaminen.

Business intelligence in Finnish companies in 2013

1. Background information

Company's name:

_____

Respondent's name:

_____

Respondent's position in the company:

_____

2. Industry

◯ a) Healthcare

◯ b) Real estate and construction

◯ c) Consumer goods and commerce

◯ d) Banking, financing, insurance business and administration of property

◯ e) Information technology, media and telecommunications

◯ f) Manufacturing industry and energy

◯ g) Other, what?

_____

A. SPECIFICATION OF THE ACTIVITY

3. Does your company have consciously organized activities to gather and analyze information about your company and the external business environment?

○ a) Yes

○ b) No (Answer to question 4. and continue to question 33.)

4. What are the most important ways and tools to keep the company's management up to date of the company's situation?

_____

_____

_____

5. What do you call these activities?

○ a) Business Intelligence

○ b) Competitive Intelligence

○ c) Liiketoimintatiedon hallinta (In Finnish)

○ d) Market Intelligence

○ e) Tiedolla johtaminen (In Finnish)

○ f) Something else, what?

_____

From now on in this survey these activities are referred to as business intelligence (BI).

B. ORGANIZATION OF BUSINESS INTELLIGENCE

6. Does your company have a separately defined strategy for business intelligence?

○ a) Yes

○ b) No

7. Is there a named person(s) responsible for internal and external business intelligence?

○ a) **Yes**, *one person* responsible for both internal and external business intelligence.
Title of the correspondent:

_____

○ b) **Yes**, *two persons*, one responsible for internal BI and the other responsible for external BI.
Titles of the correspondents:

_____

○ c) **No**. Who is responsible for internal and external business intelligence?

_____

8. Whose subordinates the named BI correspondents are?

1) Person's title: _____
Department: _____

2) Person's title: _____
Department: _____

3) Person's title: _____
Department: _____

9. How many people does business intelligence employ...

...full time? _____

...part time? _____

10. Does your company have a separate budget for business intelligence?

a) Yes. What is the budget?

○ _____

○ b) No.

11. Which of these following intelligence activities are used in your company and which of these have been outsourced?

	Activity is done internally	Activity is outsourced partly	Activity is outsourced entirely	Activity does not exist
a) Customer analysis	○	○	○	○
b) Brand analysis	○	○	○	○
c) Competitor surveillance	○	○	○	○
d) Market analysis	○	○	○	○
e) News surveillance	○	○	○	○
f) Something else, what? _____	○	○	○	○
g) Something else, what? _____	○	○	○	○

12. Who are the main users of business intelligence in your company? Evaluate the user groups according to how important the information produced by business intelligence is to them.

(1 = not at all important, 5 = extremely important)

	1	2	3	4	5
a) Top management	○	○	○	○	○
b) Middle management	○	○	○	○	○
c) Experts	○	○	○	○	○
d) Other employees	○	○	○	○	○

13. What functions in your company use information produced by business intelligence? Evaluate the following functions according to how much they use the information.

(1 = is not used at all, 5 = is used extremely much)

	1	2	3	4	5
a) Customership management	○	○	○	○	○
b) Human resources	○	○	○	○	○
c) Sales and/or marketing	○	○	○	○	○
d) Strategic business planning and development	○	○	○	○	○
e) Financial management	○	○	○	○	○
f) Supply chain management	○	○	○	○	○
g) Production management	○	○	○	○	○
h) Production planning and quality	○	○	○	○	○
i) Research and development	○	○	○	○	○
j) Something else, what? _____	○	○	○	○	○
k) Something else, what? _____	○	○	○	○	○

14. For which purposes information produced by business intelligence is used? Evaluate the following processes according to how much they use the information.

(1 = is not used at all, 5 = is used extremely much)

	1	2	3	4	5
a) Budgeting	○	○	○	○	○
b) Personnel management	○	○	○	○	○
c) Business surveillance	○	○	○	○	○
d) Strategic planning	○	○	○	○	○
e) Financial forecasting	○	○	○	○	○
f) Goal setting	○	○	○	○	○
g) Predicting the future	○	○	○	○	○
h) Something else, what? _____	○	○	○	○	○
i) Something else, what? _____	○	○	○	○	○

15. How does your company obtain employees' business intelligence?

_____

_____

_____

C. BUSINESS INTELLIGENCE METHODS AND TOOLS

16. What are the methods used by the people responsible for company's BI in order to identify the critical information needs?

(1 = not at all, 5 = extremely much)

	1	2	3	4	5
a) Questionnaires	○	○	○	○	○
b) Gut feeling	○	○	○	○	○
c) Feedback pages	○	○	○	○	○
d) Interviewing users	○	○	○	○	○
e) Following information use (e.g. downloads from a database)	○	○	○	○	○
f) General interaction and discussions with users	○	○	○	○	○
g) Something else, what? _____	○	○	○	○	○
h) Something else, what? _____	○	○	○	○	○

17. How common the given information products are for the company's *internal* business intelligence?

(1 = is not used at all, 5 = is used extremely much)

	1	2	3	4	5
a) Ad hoc, case-specific inquiries	○	○	○	○	○
b) Information products based on in advance specified information needs	○	○	○	○	○

18. How common the given information products are for the company's *external* business intelligence?

(1 = is not used at all, 5 = is used extremely much)

	1	2	3	4	5
a) Ad hoc, case-specific inquiries	○	○	○	○	○
b) Information products based on in advance specified information needs	○	○	○	○	○

19. How many internal regular information products your company produce?

◯ a) None

◯ b) 1–5

◯ c) 6–10

◯ d) More than 10

20. Evaluate the importance of the following analysis methods and tools for your company's business intelligence analyses.

(0 = do not know, 1 = not at all important, 5 = extremely important)

	0	1	2	3	4	5
a) Value chain/value network analysis	◯	◯	◯	◯	◯	◯
b) Benchmarking	◯	◯	◯	◯	◯	◯
c) Analysis of distinctive factors	◯	◯	◯	◯	◯	◯
d) Finance analysis	◯	◯	◯	◯	◯	◯
e) Analysis of competitive factors	◯	◯	◯	◯	◯	◯
f) Driving forces analysis	◯	◯	◯	◯	◯	◯
g) Patent analysis	◯	◯	◯	◯	◯	◯
h) PESTEL/APESTE/STEEP	◯	◯	◯	◯	◯	◯
i) Porter's five forces	◯	◯	◯	◯	◯	◯
j) Portfolio analysis	◯	◯	◯	◯	◯	◯
k) Risk analysis	◯	◯	◯	◯	◯	◯
l) Scenarios	◯	◯	◯	◯	◯	◯
m) Strategy canvas	◯	◯	◯	◯	◯	◯
n) SWOT	◯	◯	◯	◯	◯	◯
o) Technology forecasting	◯	◯	◯	◯	◯	◯
p) Trend analysis	◯	◯	◯	◯	◯	◯
q) Company reputation analysis	◯	◯	◯	◯	◯	◯
r) Company, market and person profiling	◯	◯	◯	◯	◯	◯
s) Something else, what? _____	◯	◯	◯	◯	◯	◯
t) Something else, what? _____	◯	◯	◯	◯	◯	◯

21. How much does your company use the following methods regarding information obtained from internal information systems?

(1 = not at all, 5 = extremely much)

	1	2	3	4	5
a) Ad hoc query and reporting	○	○	○	○	○
b) Measuring (balanced scorecard etc.)	○	○	○	○	○
c) OLAP	○	○	○	○	○
d) Planning solutions (budgeting, forecasting)	○	○	○	○	○
e) Data mining	○	○	○	○	○
f) Data visualization	○	○	○	○	○
g) Something else, what? _____	○	○	○	○	○
h) Something else, what? _____	○	○	○	○	○

22. How much the different functions of your company utilize BI's technological solutions for analyzing information obtained from internal information systems?

(1 = not at all, 5 = extremely much)

	1	2	3	4	5
a) Customership management	○	○	○	○	○
b) Human resources	○	○	○	○	○
c) Sales and/or marketing	○	○	○	○	○
d) Strategic business planning and development	○	○	○	○	○
e) Financial management	○	○	○	○	○
f) Supply chain management	○	○	○	○	○
g) Production management	○	○	○	○	○
h) Production planning and quality	○	○	○	○	○
i) Research and development	○	○	○	○	○
j) Something else, what? _____	○	○	○	○	○

23. How important are the following channels when delivering internal information products to the users?

(1 = not at all important, 5 = extremely important)

	1	2	3	4	5
a) Personal presentation	○	○	○	○	○
b) Information events	○	○	○	○	○
c) Intranet	○	○	○	○	○
d) Telephone discussions	○	○	○	○	○
e) E-mail	○	○	○	○	○
f) Social media	○	○	○	○	○
g) Company's internal interactive tools (e.g. chat tools)	○	○	○	○	○
h) BI portal	○	○	○	○	○
i) Something else, what? _____	○	○	○	○	○

D. BENEFITS OF BUSINESS INTELLIGENCE

24. Evaluate the benefits achieved with business intelligence in your company.

(1 = does not apply to our company, 5 = applies well to our company)

	1	2	3	4	5
a) Opportunities and threats recognized earlier than before	○	○	○	○	○
b) Improved product or customer profitability	○	○	○	○	○
c) More rational information gathering	○	○	○	○	○
d) Increased sales and market shares	○	○	○	○	○
e) Accumulated knowledge	○	○	○	○	○
f) Increased knowledge sharing	○	○	○	○	○
g) Faster decision-making processes	○	○	○	○	○
h) Optimized acquisitions and costs	○	○	○	○	○
i) Improved quality of production and products	○	○	○	○	○
j) Improved quality of information	○	○	○	○	○
k) Cost savings	○	○	○	○	○
l) Time savings	○	○	○	○	○
m) More efficient operative reporting	○	○	○	○	○
n) Decision-makers understand better the value of knowledge	○	○	○	○	○
o) Recognized new business opportunities	○	○	○	○	○
p) Improved resource planning	○	○	○	○	○
q) Improved competitiveness	○	○	○	○	○
r) Faster response in competitive situations	○	○	○	○	○
s) Improved strategic goal setting	○	○	○	○	○
t) Improved strategy building	○	○	○	○	○
u) Something else, what? _____	○	○	○	○	○
v) Something else, what? _____	○	○	○	○	○

25. Does your company measure the benefits achieved with business intelligence?

○ Yes. How?

_____

○ No. Why not?

_____

26. Does your company collect feedback from users about business intelligence?

○ Yes. How?

_____

○ No. Why not?

_____

27. The following list contains information needs that business intelligence usually aims to satisfy. Evaluate how important these information needs are to your company.

(1 = not at all important, 5 = extremely important)

	1	2	3	4	5
a) Information regarding customers' industry	○	○	○	○	○
b) Customer information	○	○	○	○	○
c) Competitor information	○	○	○	○	○
d) Market specific information	○	○	○	○	○
e) Information regarding own industry	○	○	○	○	○
f) Information regarding parallel industries	○	○	○	○	○
g) Information regarding technology	○	○	○	○	○
h) Information regarding economical situation and macro trends	○	○	○	○	○
i) Information regarding own business processes	○	○	○	○	○
j) Product and customer profitability information	○	○	○	○	○
k) Something else, what? _____	○	○	○	○	○
l) Something else, what? _____	○	○	○	○	○

28. How do you assess your company's success in different areas of BI?

(1 = poor, 5 = excellent)

	1	2	3	4	5
a) Internal business intelligence	○	○	○	○	○
b) External business intelligence	○	○	○	○	○
c) Analyze of business information	○	○	○	○	○
d) Use of business intelligence in operative decision making	○	○	○	○	○
e) Use of business intelligence in strategic decision making	○	○	○	○	○
f) Applying BI's technological solutions	○	○	○	○	○
g) Obtaining employee's business intelligence	○	○	○	○	○
h) Business intelligence as an entirety	○	○	○	○	○

29. Possibility to argument the choices made in question 28:

_____

_____

_____

30. To which questions your company would like to have answers with the help of business intelligence?

_____

_____

_____

E. FUTURE

31. Do you believe that your company's investments in business intelligence in the next five years will…

- ◯ a) increase substantially
- ◯ b) increase moderately
- ◯ c) remain the same
- ◯ d) decrease moderately
- ◯ e) decrease substantially

32. Possibility to argument the choices made in question 31:

_____

_____

_____

33. In which BI area the investments are going to be…

a)… the same as before?

_____

_____

b)… more than before?

_____

_____

c)… less than before?

_____

_____

34. Which of the following methods your company is planning to start utilizing or substantially increase utilizing within the next year?

- ☐ a) Ad hoc query and reporting
- ☐ b) Measuring (balanced scorecard etc.)
- ☐ c) OLAP
- ☐ d) Planning solutions (budgeting, forecasting)
- ☐ e) Data mining
- ☐ f) Data visualization
- ☐ g) Something else, what?

  _____
- ☐ h) Something else, what?

  _____
- ☐ i) None of the above

35. In which functions does your company plan to start utilizing or substantially increase the utilization of BI's technological solutions within the next year?

- ☐ a) Customership management
- ☐ b) Human resources
- ☐ c) Sales and/or marketing
- ☐ d) Strategic business planning and development
- ☐ e) Financial management
- ☐ f) Supply chain management
- ☐ g) Production management
- ☐ h) Production planning and quality
- ☐ i) Research and development
- ☐ j) None of the above

36. Evaluate possible areas of improvement in business intelligence in your company.

(1 = not at all important, 5 = extremely important)

	1	2	3	4	5
a) Being on schedule	○	○	○	○	○
b) Increasing the analysis capacity	○	○	○	○	○
c) Increasing employees' attention of business intelligence	○	○	○	○	○
d) Employees' competences	○	○	○	○	○
e) Personnel resources	○	○	○	○	○
f) Management commitment	○	○	○	○	○
g) Identifying critical information needs	○	○	○	○	○
h) Better use of current BI's information systems	○	○	○	○	○
i) Utilization of company's internal information	○	○	○	○	○
j) Developing information systems and tools	○	○	○	○	○
k) Making more profound analyses	○	○	○	○	○
l) Measuring the benefits	○	○	○	○	○
m) Commercializing the operations	○	○	○	○	○
n) Prioritizing and satisfying information needs	○	○	○	○	○
o) Counterintelligence	○	○	○	○	○
p) More effective knowledge sharing	○	○	○	○	○
q) More efficient information gathering	○	○	○	○	○
r) Something else, what? _____	○	○	○	○	○

37. Evaluate the given trends by their development of significance in your company's business intelligence within the next three years.

(1 = the importance will decrease substantially, 2 = the importance will decrease moderately, 3 = the importance will remain the same, 4 = the importance will increase moderately, 5 = the importance will increase substantially)

	1	2	3	4	5
a) Utilization of mobile technology	○	○	○	○	○
b) Utilization of cloud services	○	○	○	○	○
c) Utilization of big data	○	○	○	○	○
d) Utilization of analytics	○	○	○	○	○
e) Utilization of open data	○	○	○	○	○
f) Utilization of real time data	○	○	○	○	○
g) Utilization of social media	○	○	○	○	○
h) Increase of user friendliness and usability of technological tools	○	○	○	○	○
i) Acknowledge of information security	○	○	○	○	○
j) Business intelligence becoming part of everyday life and integrating to daily tools	○	○	○	○	○
k) Use of own personal devices in BI functions	○	○	○	○	○
l) Dissemination of business information on all hierarchical levels	○	○	○	○	○
m) Integration of business intelligence as part of company's different functions	○	○	○	○	○
n) Integration of different business intelligence solutions	○	○	○	○	○
o) Utilization of foreign business intelligence service providers	○	○	○	○	○
p) Outsourcing of business intelligence functions	○	○	○	○	○
q) Employees' self-imposed information retrieval	○	○	○	○	○
r) Juridical control, certificate demands and other demands of the control environment	○	○	○	○	○
s) Something else, what? _____	○	○	○	○	○
t) Something else, what? _____	○	○	○	○	○

38. What kind of changes and developments do you believe business intelligence will face in the next five years?

_____

_____